COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

SPECIAL REPORT

Inside —

Data Communications Terminals: Discussing the Alternatives

IBM Powers Up System/38 By Adding High-End CPU

By Tim Scannell
CW Staff

RYE, N.Y. — IBM last week expanded its System/38 computer line by introducing a high-end system that is said to feature twice the maximum main memory and up to twice the performance of the previous top-of-the-line System/38 processor.

In addition, the firm last week:

- Reduced the purchase price of its previous high-end System/38 Model 5.
- Enhanced the communications capabilities of all models in the System/38 family, allowing users to connect a System/38 to a Series/1 computer locally and reportedly facilitate the linking of computers via public or private networks.
- Announced that effective June 24 it will stop marketing System/38 configurations with 512K bytes of main storage. It will also withdraw from marketing Model 5 machines with 768K, 1.28M and 1.79M bytes of disk storage, as well as Model 3 systems with 64M bytes of storage capacity.

The high-end System/38 introduced by IBM last week — the Model 7 — has a main memory ranging from 2M to 4M bytes compared with the previous maximum memory of 2M bytes with the Models 4 and 5. The system also offers main and control storage cycle times that are about one-third faster than other System/38 machines, according to an IBM spokesman.

For example, the Model 7's main storage cycle time is 400 nsec compared with the 600 nsec rating of the Model 5; the Model 7's control storage minimum cycle time is 133 nsec compared with 200 nsec times for Models 4 and 5, according to the spokesman.

The Model 7 is said to feature a 4K-word increase in control storage size, which also boosts the system's overall performance, depending on user work loads and operating environments. The system can support nearly 2.7G bytes of disk storage, eight multiple-device communications lines, two system printers and 80 local terminals.

A System/38 Model 7 with

(Continued on Page 4)

Honeywell Expands DPS Line

WALTHAM, Mass. — Honeywell, Inc. has expanded its large-scale Distributed Processing System line by adding a mid-range processor.

At the same, the firm announced dual-processor and full-tandem system options for DPS/8 computers operating under Honeywell's Gcos or CP-6 multiuser operating systems.

The newly introduced DPS 8/50 incorporates 64K-bit memory chips and is said to have 74% the performance of the firm's DPS 8/52 machine. The first addition to the DPS series in more than a year, it increases the number of processors at this particular systems plateau to four: the DPS 8/50, 8/52, 8/62 and 8/70, according to a Honeywell spokesman.

(Continued on Page 4)

Three Debuts at Interface '82

Protocol Converters Star at Show

By Phil Hirsch
CW Washington Bureau

DALLAS — Reflecting what may become a significant trend in data communications networking, three protocol converters were unveiled here last week at Interface '82:

- Datastream Communications, Inc. announced its T8 Host-Terminal Interface Extension (HTIX), which allows an asynchronous terminal to communicate with IBM mainframes using IBM's Synchronous Data Link Control or Binary Synchronous Control protocols.
- Icot Corp. added SDLC capability to its Model 352 virtual terminal system, which was introduced last December with a BSC handler.
- Icot also announced a packet assembler/disassembler that enables asynchronous terminals to interconnect with public and private X.25-based packet-switched networks.

Coverage of Interface '82 continues on Pages 8-13.

Mainframes typically utilize synchronous protocols, while terminals, minicomputers, small business computers, word processing equipment and desktop computers are asynchronous. One way a user can currently link its mainframe with the latter equipment is via an IBM 3270 cluster controller; another is to use the protocol conversion facilities of a public packet-switched network.

"An IBM or compatible 3270 cluster controller is expensive and must be directly attached or multidropped on leased lines. The terminal can be located no more than 5,000 feet from the cluster controller. The cost of the leased lines can be several thousand dollars a month," according to Charles Askanas, president of Datastream. "In short, the 3270 cluster controller is designed for dedicated applications with terminals located in a very few locations," Askanas added.

(Continued on Page 8)

U.S. Eyeing 'Smart Cards' To Replace Food Stamps

By Tim Scannell
CW Staff

WASHINGTON, D.C. — The U.S. Department of Agriculture has announced plans to replace federally funded food stamps with plastic microcomputer-embedded "smart cards" that can be programmed with such information as the holder's sex, marital status and medical condition.

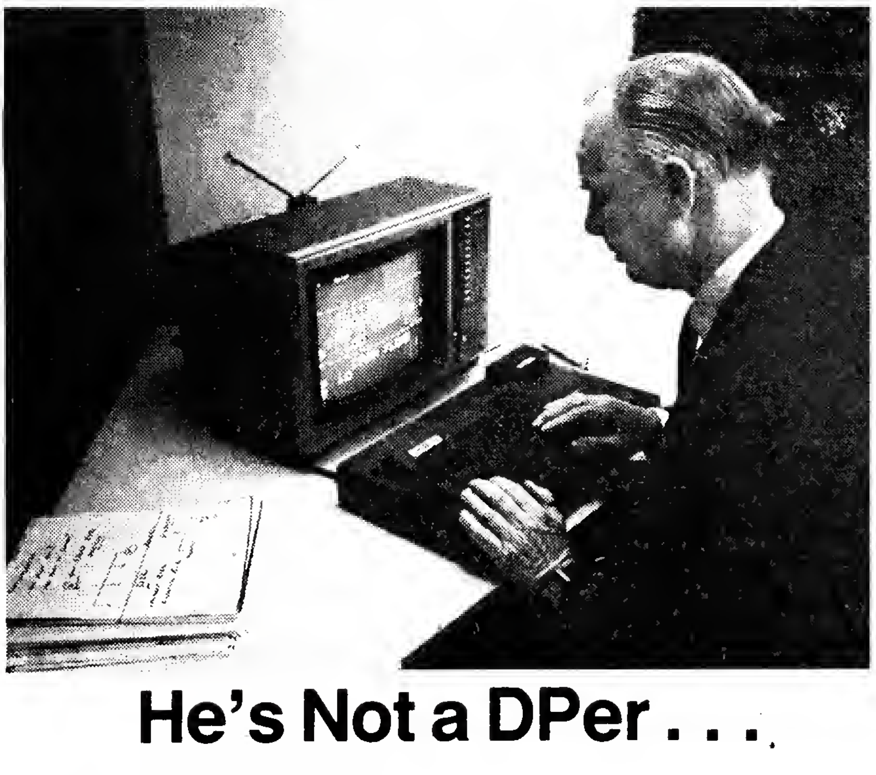
The reason? The credit-card-size devices could not only eliminate a lot of paperwork associated with the food stamp program, but could put a sizable dent in food stamp fraud, estimated at about $1 billion per year, according to initial projections.

The government would like to conduct in-the-field tests of the smart card sometime this year, according to an Agriculture Department spokesman. However, because of the developmental costs involved and the current U.S. economic climate, pilot projects probably will not get off the ground until early next year.

Plans for the government's use of the smart card surfaced earlier this month at an international meeting held in Scottsdale, Ariz., which focused on current developments and future applications of the smart card.

Near the close of the meeting, Richard Sprague, speak-

(Continued on Page 6)



He's Not a DPer . . .

. . . He's the vice-president of corporate planning at Westinghouse Electric Corp., and he's checking a discounted cash-flow calculation for value-based planning on a program he wrote himself. Don Povejsil is one of 91 Westinghouse executives who have taken an in-house course offering training in the use of personal computers for management. Story on Page 5.

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Computers May Command Space Shuttle's Landing

By **Tim Scannell**
CW Staff

KENNEDY SPACE CENTER, Fla. — As nearly a million people watched and cheered, the *Columbia* roared off into orbit around the Earth last week on its third and longest space mission. Although computers played a major role in previous space shuttle flights — controlling the shuttle's launch, guiding the ship and its functions during each flight and later processing data collected during the missions — this third shakedown mission involves the heaviest use of computer and data processing systems to date.

Piloted by astronauts Jack Lousma and Gordon Fullerton, the shuttle is expected to complete 116 orbits and travel more than three million miles in space before it makes its scheduled landing this afternoon at the White Sands Missile Range in New Mexico.

During its landing, the shuttle's astronauts may for the first time turn over command of the *Columbia* to the on-board computers. The system, called Autoland, would be activated about 10,000 feet above the ground and take the shuttle to within 100 feet of touchdown, when *Columbia*'s pilot would resume command.

The landing system — based on the four IBM System/4 Pi computers on the shuttle — will control the spacecraft's descent glide for about 78 seconds during which more than 19 million software instructions will be executed.

The on-board computers were also scheduled to control the 50-foot-long mechanical "arm" that is part of *Columbia*'s Remote Manipulator system. The crane-like arm will be used by future shuttle personnel to retrieve satellites and to move payloads.

Finally, the third space shuttle flight involves an expanded set of onboard computer programs developed by IBM and produced at the National Aeronautics and Space Administration's Software Production Facility.

Keep an Eye On Your Mailbox

Watch the mail — the premiere issue of *Computerworld OA* will be arriving on your desk this week.

Computerworld OA is a quarterly publication filled with in-depth articles on the issues, trends and technology surrounding the exploding office automation industry. It is designed to help you — the management information systems professional — become your firm's authority on OA.

Upcoming issues will focus on how OA can be used in organizations, the human and organizational facets involved in its implementation and current and future OA technology. All four issues this year will be sent to you free as part of your CW subscription.

House Subcommittee Approves H.R. 5158

WASHINGTON, D.C. — The House of Representatives Telecommunications Subcommittee voted last week 15-0 to approve H.R. 5158, its rewrite of the 1934 Communications Act, with eight amendments.

The specific amendments that were tacked on to the bill were unknown at press time.

The bill will go before the House Committee on Energy and Commerce, under which the telecommunications subcommittee operates, in late April or early May, a spokesman said.

Hearing Ordered On Dismissal Of U.S. vs. IBM

NEW YORK — A hearing to determine if the dismissal of the U.S. vs. IBM antitrust trial should be nullified was recently ordered by the former presiding judge in the case.

Acting upon a motion by Philip M. Stern, an author and philanthropist who appeared amicus curiae — as "a friend of the court" — Judge David N. Edelstein granted an April 19 hearing. Stern reportedly requested the hearing to scrutinize the Jan. 8 dropping of the case by the U.S. Justice Department and also to determine if the consulting work Justice Department antitrust chief William F. Baxter performed for a legal firm representing IBM in West Coast antitrust actions in 1975 [CW, March 8] tainted or influenced his decision.

Edelstein called for IBM and Justice Department lawyers to appear at the hearing and show "why the stipulation of dismissal filed in this action on the eighth day of January 1982 is not ineffective and a nullity." The judge said that he wanted the hearing to explore why the dismissal action was not first submitted to the court to determine whether it was "in the public interest" and to explore whether Baxter was qualified to decide on dropping the case because of his "prior participation in a related action."

IBM Senior Vice-President and General Counsel Nicholas deB. Katzenbach said in a prepared statement that "there is no authority or justification for these orders. The IBM case is over . . . I can find no explanation for Judge Edelstein's orders."

A spokesman for the Justice Department in Washington, D.C., said, "Our understanding is that the IBM case was dismissed on Jan. 8. The current order, as we understand it, is an order entered by the judge ex parte — without notification to the government."

This Week

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Analysts Say IBM Accented Gap From 34 to 38

By Tom Henkel
CW Staff

The announcement of a new top-of-the-line System/38 processor and the elimination of smaller System/38 systems spotlighted the glaring lack of a processor bridge between those systems and the aging System/34.

IBM has long indicated there would be larger models of the System/38. Some analysts, like Ken Harvey, president of CSP Ken Harvey, Inc., have observed that the System/38 theoretically can be expanded to become much larger than IBM's current top-end processor, the 3081.

The elimination of small System/38 processors with less than 2M bytes of memory is being viewed by some analysts as more of an issue than the introduction of the Model 7. While withdrawing the low-end processors was something of an embarrassment to IBM, Yankee Group analyst Gerard Hallaren said that it had to be done to avoid problems down the road.

Hallaren explained that during the summer of 1979 IBM was forced to delay delivery of the first System/38 processors because of software problems. The solutions to those software problems required more processor overhead than IBM originally bargained for, other analysts claimed.

Hallaren said that IBM sales representatives have been steering clear of recommending machines smaller than 1M-byte System/38 processors for some time. In addition, early users of Model 3 processors reported that IBM had suggested they buy larger processors as early as the summer of 1979.

The demise of the smaller System/38 processors raises the question of how IBM will fill the obvious gap between the older System/34 and newer System/38 product lines.

The two processors are not software-compatible. The System/34 is based in the older RPG-II programming language, while the System/38 uses a superset of that language, RPG-III. While IBM has been offering conversion software to aid users migrating to System/38's object-oriented architecture, both analysts and users have reported the conversion aids are so far difficult to use.

Jack Hart, an analyst with International Data Corp., predicts that IBM may eventually introduce a hybrid processor that has characteristics of both the System/34 and System/38. Currently, both processors differ dramatically in terms of architecture, Hart said.

Model 7 Gives System/38 Line a Boost

(Continued from Page 1)

2M char. of main storage costs $161,000, more than $30,000 less than the original cost of the less powerful Model 5. A 4M-char. Model 7 costs $1960,000. The 2M-char. model can be leased for $6,100/mo and the 4M-char. version for $7,500/mo under a three-year agreement; monthly rental charges are $7,015 and $8,625, respectively. Volume discounts are available, IBM noted.

Initial deliveries of the System/38 Model 7 are scheduled for the first quarter of 1983. However, upgrade packages for present System/38 users will be available in June, the spokesman said.

Apparently acknowledging the internal competition that the Model 7's introduction may cause, IBM reduced the purchase price of the System/38 Model 5 by 10% to 19.5%, depending on the configuration. Rental, lease and monthly maintenance charges are not affected.

The System/38 communications enhancement announced last week is said to allow a Series/1 computer to be locally attached to a System/38, permitting program-to-program data transfers. Computers are connected by cables and can be spaced up to 400 ft apart.

Communications are accomplished via a Binary Synchronous Communications (BSC) point-to-point protocol and occur at line speeds up to 56K bit/sec, the spokesman explained.

The local high-speed attachment is seen by some analysts as a precursor to IBM's eventual introduction of a complete local-area network. It can also be used in automated manufacturing or industrial environments to handle communications and monitor in-plant operations.

At the moment, the device is available at no charge to current System/38 users.

IBM also increased the number of high-speed local communications lines that can be attached to the System/38, allowing one line per communications attachment. The lines enable users to locally connect System/38 processors to other System/38s, as well as to System/34 and Series/1 computers. Previously, only one local line could be installed per system, the spokesman said.

Finally, the firm enhanced BSC support for the System/38 machines, reportedly allowing users to attach IBM 3776 Models 1 and 2 and 3777 Model 1 batch terminals to the processor via point-to-point switched or nonswitched lines. The BSC enhancements, which reside in the System/38's operating system, also let users write applications programs to communicate with systems and devices compatible with 3780 BSC implementations.

All IBM BSC enhancements — which are scheduled to be shipped in June — are available at no additional charge to current System/38 users.

Name of Game: Compatibility

RYE, N.Y. — The name of the game in systems introductions is compatibility. In keeping with that idea, IBM supplemented its introduction of the System/38 Model 7 last week by enhancing a number of software products aimed at increased compatibility.

In an effort to ease difficulties users might have in converting from a System/34 to the more powerful System/38, IBM revamped its System/34 to System/38 Conversion Aid licensed program. The program converts System/34 RPG-II source code, operation control language, displays and data files so they can be processed on a System/38, a spokesman noted.

The System/34 to System/38 Conversion Aid carries a one-time fee of $1,495.

The firm also enhanced its System/38 RPG III and Cobol programming languages, reportedly making them more compatible with the System/34.

In addition, IBM enhanced its Control Program Facility (CPF) for the System/38 by:

- Adding a system-supported journal facility aimed at improving recovery, backup and audit trails.
- Adding improved save and restore facilities.
- Enhancing its work management displays.
- Increasing the number of entries permitted in the CPF's object definition table from 8K bytes to 32K bytes to handle larger program compilations.

All IBM programming enhancements will be available in September.

In addition to these enhancements, the firm also announced that customers may now elect to license certain System/38 programs by paying a continuous monthly charge or a one-time charge. Programs available for a one-time fee include System/38 CPF, RPG III, Cobol, Remote Job Entry Facility, Interactive Data Base utilities and the Conversion Reformat utilities.

Honeywell Adds DPS 8/50

(Continued from Page 1)

Architecturally similar to other systems in the DPS 8 line, the DPS 8/50 has a maximum main memory of 32M bytes and includes an I/O multiplexer that can handle 35 to 54 channel function slots. Peripheral subsystems include a system console, mass storage processor, mass storage units, a magnetic tape processor, a unit record processor and a document handler processor.

Languages that can be used with the 8/50 include Cobol 74, Fortran-77, RPG-II, Pascal and Lisp/66.

The system can be field upgraded to a DPS 8/52, 8/62 or 8/70 processor. The top-of-the-line 8/70 has a Gcos configuration range of up to four processors, four system control units, and four I/O multiplexers, the spokesman noted.

The 8/50 system with Gcos and 2M bytes of memory costs $285,000. Its one-year rental price is $14,951/mo. Its lease price is $12,363/mo over a five-year period.

In the second half of its announcement last week, Honeywell expanded its dual-processor and full-tandem system options to include the processors in the 8/50 family. Using the tandem option, systems can be linked under one copy of the same operating system.

These capabilities were previously limited to the DPS 8/44, the spokesman noted.

Corrections

In the chart accompanying the March 22 Product Spotlight on a selection of the major IBM-compatible data dictionaries, some information on IBM's DB/DC Data Dictionary, was out of order. The blank that occurred in the category of "Data Administration Features" should have occurred under the "Estimated User Base" category. Data administration features for IBM's DB/DC are sign-on security via Resource Access Control Facility (RACF) and user authorization by status. User exits are provided; source code is available. Pricing is $806 for the OS version and $319 for the DOS version.

In "Dataview Unveils Desktop, Portable Z80A-Based Line" [CW, March 8], the name of the vendor, Datavue Corp., was misspelled. In addition, the firm's recently announced product, the Datavue 80, is available with 64K bytes of main memory using a Z-80A microprocessor.

The processor, which is available in three basic models, uses both 5¼-in. floppy and hard disk drives. The entry-level 100 series uses a single floppy drive, while the mid-range 200 series uses a dual floppy. The top-of-the-line 300 series uses a combination floppy and hard disk storage system. The floppy disks are available with either 256K-, 512K- or 1M-byte densities and the hard disk is available in either 6M-byte or 10M-byte densities, the vendor said.

An entry-level system with 256K bytes of peripheral storage costs $1,995. A Series 300 processor with 10M bytes of hard disk storage and 1M byte of floppy disk storage costs $6,945, the vendor said from 1911 22nd Ave. S., Seattle, Wash. 98144.

"Columbia University to Construct $5.2 Million Computer Center" [CW, March 1] should have noted that the chairman of the Computer Science Department, Dr. Joseph F. Traub, expects the number of computer science majors at Columbia to increase by nearly 100 next year, not 1,000.

The OEM cost of a "complete" Ethernet interface with separate transceivers will drop to roughly $125 by 1985, an Intel Corp. spokesman has said. "Ethernet Coming This Year in MSI Chips" [CW, Feb. 22] was misleading, he said, in conveying an estimate that the OEM cost of Ethernet chips would drop to less than $200 each by 1985. By that year, Ethernet will be shipped on very large-scale integration rather than medium-scale integration chips, he said.

Yourdon covers more ground in eighty two.

STRUCTURED SYSTEMS DEVELOPMENT
HONOLULU APRIL 13
ATLANTA APRIL 15
LONDON APRIL 16
NEW YORK APRIL 19
PROVIDENCE APRIL 26
BOSTON MAY 10
PORTLAND MAY 19
LAKE TAHOE MAY 21
COPENHAGEN MAY 24
MEXICO CITY MAY 24
TORONTO JUNE 3
LONDON JUNE 4
CHICAGO JUNE 4
HOUSTON JUNE 28
INDIANAPOLIS JUNE 30

STRUCTURED PROGRAMMING WORKSHOP
NEW YORK APRIL 26-30
PHOENIX MAY 17-21
MILWAUKEE JUNE 21-25

STRUCTURED PROGRAMMING WORKSHOP IN COBOL
BOSTON APRIL 19-23
LOS ANGELES MAY 3-7
WASHINGTON, DC MAY 10-14
SAN FRANCISCO JUNE 14-18
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INFORMATION MODELING WORKSHOP
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ANAHEIM APRIL 19-23
SAN FRANCISCO APRIL 26-30
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DATABASE ADMINISTRATORS LECTURES
CHICAGO APRIL 20-22
NEW YORK JUNE 2-4

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DP Teacher Charged in Funds Transfer Scam

By Bob Johnson
CW New York Bureau

NEW YORK — A DP instructor at New York University and three others were arrested here last week and charged with electronically stealing $273,000 from the U.S. branch of a foreign bank.

The Banco de la Nacion Argentina discovered after a routine audit that $185,000, which it had deposited with a Manufacturers Hanover Trust Co. bank branch in lower Manhattan, had been transferred to a Bronx branch of the Chase Manhattan Bank and deposited in the account of Computer Technical Institute (CTI). The Argentinian bank then contacted the Bronx District Attorney's Office.

Randolph Beamon of the Bronx, a teacher of computer courses at New York University, was listed as the head of CTI, according to Ed McCarthy, a spokesman for the Bronx District Attorney's Office. McCarthy said that CTI is a dummy company.

Also charged with grand larcency along with Beamon were Charles Ledbetter, Warnell Vega and Jacqueline Calhoun. According to McCarthy, Ledbetter was formerly head of the Argentinian bank's compensation, reconciliation and investigations unit and Vega is a former clerk in the bank's New York headquarters.

McCarthy said the four were aware that a new telephone clerk was on the job at the branch of the Manufacturer's Hanover Trust Co. They allegedly called the clerk and gave her the correct five-digit code number of the Argentinian bank's account number and had the money transferred to their CTI account in the Bronx.

The telephone clerk apparently did not make the required follow-up confirmation call, McCarthy said, and the money was transferred.

After investigating the $185,000 theft, detectives in the rackets bureau of the Bronx District Attorney's Office also discovered thefts totaling $88,000 that had been transferred from the Argentinian bank's account to CTI's account in 1980 and then withdrawn. It is believed that Ledbetter was in a position at the bank at that time that allowed him to intercept receipts that would have disclosed the stolen money.

'Smart Cards' Eyed to Replace Food Stamps

(Continued from Page 1)

ing for William Hoagland, special assistant to Agricultural Secretary John R. Block, announced that the Reagan administration is "keenly interested in the use of electronic technology to eliminate fraud as well as paperwork and thereby reduce the costs of food stamps and other welfare programs." The two-day seminar — which included nearly 80 officials and executives from the government and a variety of computer, communications and banking firms — was sponsored by Intelmatique, the worldwide promotional arm of the French telecommunications industry.

The U.S. government became interested in the smart card about two months ago when a prototype system was demonstrated for a number of federal departments in Washington, D.C. The Department of Agriculture subsequently launched an internal study and formed a task force to study the possible applications of the card.

Food stamps and other government-subsidized welfare programs were seen as natural applications of smart card technology for two reasons. First, use of the device would reduce the amount of paperwork usually associated with government programs. Second, since the card not only stores user information, but also keeps track of transactions, it would cut down on the amount of welfare fraud and abuse, the Agricultural Department's Sprague said.

A number of states have already expressed interest in participating in the planned government tests, including Michigan, Florida, Iowa and Maryland. However, the future of government pilot programs will depend on how much start-up money smart card and systems vendors will be willing to absorb, Sprague observed.

The banking industry has also shown a great deal of interest in smart cards, particularly as replacements for standard credit and automatic teller machine cards. In fact, the First National Bank of Minneapolis intends to test the French devices on a limited basis within three months.

The Chase Manhattan Bank of New York also intends to take smart cards out for a trial run sometime in the near future, Thomas Cahill, vice-president for advanced systems technology at the bank, revealed.

The smart card was initially developed by CII-Honeywell Bull, Inc. and later expanded upon by two other French firms: Flonic Schlumberger and Philips Data Systems, Inc.

'Smart Card' Meeting Little Resistance

By Tim Scannell
CW Staff

Although widespread use of the "smart card" may make some people envision the Orwellian society of the literary classic *1984*, the technology has met virtually no resistance from consumer protection groups that have traditionally been quick to oppose any kind of a sophisticated, government-run computer system that might threaten personal privacy.

One major reason for this is that the technology is still very much in its infancy, explained Arlen Lessin, president of Communications Consulting Corp., a New York-based engineering and consulting firm. Another, more important reason is that the smart card differs from other data base devices because it gives its user full control over who has access to the embedded personal information.

However, some resistance to the government's automated welfare plan is inevitable. While the American Civil Liberties Union (ACLU) has not looked into the smart card issue, it does plan to launch some type of an investigation in the near future.

"It sounds like something we'd like to look into," John Shattuck, director of the ACLU's Washington, D.C., operations, said. "Our general objection to the use of increased identification requirements for welfare recipients and for people seeking jobs is that it gives the government an opportunity to collect additional information about people and follow their activities and make judgments about them without their knowledge."

However, Shattuck is not sure whether this objection would apply to the government's use of smart cards since the user can restrict access to it.

From a design standpoint, access to smart card data is internally protected by a level of security similar to the Data Encryption Standard, which is recommended by the National Bureau of Standards and used by the government for its own applications. To begin a transaction, users insert the card into a specially designed reader — similar to an automatic teller machine — and punch in a personal identification number that is programmed into the card's memory.

Users have three chances to enter the correct card code. If the third attempt is unsuccessful, consultant Lessin explained, a *Mission Impossible* occurrence takes place: "Although there is no smoke, in essence the card's circuitry is made useless," he said. "At that point, the function of the card is no longer anything more than a piece of plastic."

While on-card security is tight, Lessin admits that no code — no matter how sophisticated — is impossible to break. However, breaking this code would be impractical, he said.

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On Personal Computers

Eager Westinghouse Execs Getting DP Training

By Marguerite Zientara
CW Staff

PITTSBURGH, Pa. — There is "a revolution in the making" at Westinghouse Electric Corp., where eager top executives and managers are getting hands-on training in the use of personal computers for management.

While Westinghouse personnel have been learning through internal training about applications of microprocessors since 1979, the month of January saw the piloting of two new courses on the use of personal computers in management.

Ninety-one managers in engineering, manufacturing, quality control and the human resource function have attended the first of a series of courses entitled "Management Applications of Personal Computers" for both the Apple Computer, Inc. Apple II+ and Radio Shack TRS-80 Model III computers.

In addition, on Jan. 29 a half-day hands-on executive tutorial on the use of personal computers was presented to Westinghouse's Management Committee, including Vice-Chairman of the Board Douglas D. Danforth and the four company presidents.

Indicating that such in-house training of the top brass is "unusual," Dr. Yolanda Willis, manager of engineering and manufacturing training, noted that "it is rather rare that the Management Committee has time to attend Education Department courses, and I think it's unheard of that they would take a hands-on course at the presidential level. I think it was a first."

What Causes Interest?

From where does Westinghouse's intense interest in personal computing for managers come? "The people that already have computers have shown great increases in productivity, in terms of cutting time-sharing costs, in improving their own efficiency and in doing strategic and financial planning that is infinitely more sophisticated and accurate by themselves without computer specialists in the DP department acting as intermediaries," Willis said in an interview last week.

"When a programmer gets a programming request, he or she typically has little appreciation of what the top-level manager is driving at," Willis explained. "Such programming may be accurate and technically sophisticated, but it is clearly done by rote. It precludes creative and iterative exploration of alternatives," she added. "It's that very intimate interaction between the manager and the computer that really produces the impact."

The courses designed by Willis' department are structured in two versions. The Apple II+ course is being given by Integrated Computer Systems, Inc., a Los Angeles-based firm. "Management Applications of Personal Computers: TRS-80" is being given by John Nevison Associates of Concord, Mass. A third course is planned that will incorporate either Hewlett-Packard Co. or IBM personal computers, Willis indicated.

Topics covered in the two-day courses include a survey of management applications currently available, the relationship of these management techniques to the traditional corporate-level DP function, sales projection analysis, budgeting analysis, the use of computer graphics in management, the development of a simple data base and electronic mail.

The course will be repeated 15 to 20 times during 1982 and will familiarize as many as 400 Westinghouse employees with the use of personal computers as a management tool.

With all this training going on, one might well ask how many executives at Westinghouse actually have a personal computer at their disposal. The exact number is unknown, but "personal computer acquisition is so frequent now that in six months the number could be twice as much as it is now," Willis said.

"Among the executive vice-presidents, some have given personal computers to all the people on their staff, while other pockets of the company don't have any at all. There is no norm."

While it is too early to tell how effective the personal computing courses have really been, "We have users that support the effort who already have realized thousands of dollars of cost-cutting," Willis noted.

"After our planning department at headquarters received their first three Apples, they saved $22,000 in less than two months, which easily amortized the purchase of the machines," Willis said, explaining that they had been "very heavy time-sharing users."

Also just initiated, in response to a great demand, is a separate Apple and TRS-80 course for professional and clerical personnel. "We didn't want to mix them up with the managers because generally the clerical people know the keyboard too well and they may intimidate the managers," Willis observed.

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Wide Range of Products Introduced at Conference

By Bruce Hoard
CW Staff

DALLAS — While the product announcements from Icot Corp. and Datastream Communications, Inc. took center stage at the Interface '82 conference here last week (story on Page 1), new products ranging from modems to microwave systems were also unveiled.

Modem-wise, Timeplex, Inc. and Datec, Inc. came forward. The Timeplex Series 9600 V.29 Plus is an intelligent device featuring 9,600 bit/sec data transfer and V.29 compatibility. It is said to offer built-in asynchronous-to-synchronous conversion for any one or more of the four input channels.

Other features include automatic downline loading of all parameter and configuration changes to the remote site and unlimited intermix of 2,400-, 4,800- and 7,200 bit/sec channels up to an aggregate of 9,600, Timeplex said. The modem costs $4,600 from Timeplex at One Communications Plaza, Rochelle Park, N.J. 07662.

The Model 212 modem introduced by Datec transmits at either 300 or 1,200 bit/sec, connects directly to any phone and operates in full- or half-duplex mode over dial-up and leased lines, a spokesman said. It costs $795 per stand-alone and $695 per card.

CW at Interface '82

An autocall unit option costs $100, according to Datec, which is based at Suite 116, 200 Eastowne Drive, Chapel Hill, N.C. 27514.

Timeplex joined Halcyon Communications, Inc. and General Datacomm Industries, Inc. in unveiling multiplexers.

The Statkat multiplexer family from General Datacomm features four, eight, 12 or 16 channels and 15 selectable channel rates. In addition, the devices offer automatic transmission rate detection at 110 to 1,200 bit/sec and a composite rate of up to 19.2K bit/sec or 1,200, 1,800 or 9,600 bit/sec asynchronously.

The Statkats range in price from $1,945 to $4,830. General Datacomm is based at One Kennedy Ave., Danbury, Conn. 06810.

The Halcyon 4220 network system is a successor to its 4200 point-to-point statistical multiplexer and includes dual link, split link and diagnostic tools. Components in a 4220 system consist of at least one 4221 master processor and one or more slave 4222 processors. Synchronous protocols available include IBM 3270, 2780, 3780; Control Data Corp. 200UT; Sperry Univac U100/200 and 1004; Honeywell, Inc. VIP; and Burroughs Corp.

In an eight-channel version, the 4221 costs $5,200 and the 4222, $5,100. Halcyon is at 2121 Zanker Road, San Jose, Calif. 95131.

The Timeplex Miad four-channel statistical multiplexer supports asynchronous traffic only and is freely interchangeable on existing synchronous/asynchronous models. Data speeds range from 50 to 9,600 bit/sec on the $750 unit.

Destek Group introduced two local-area network interface boards, one for the IBM Personal Computer and another for Intel Corp. Multibus-based systems. The boards are part of the vendor's Desnet local-net family.

The Desnet/IBM-PC board utilizes a variation of IBM's High-Level Data Link Control (HDLC) protocol and the access method is carrier-sense multiple access with collision detection (CSMA/CD). It costs $1,000.

The Desnet Multibus board is a single-board intelligent controller that meets the physical and electrical specifications of the IEEE P796 standard, Destek said. It is priced at about $2,000, a Destek spokesman said from 1923 Landings Drive, Mountain View, Calif., 94043.

Com Corp. is offering a Multibus Ethernet local-area network board. The 3C400 Multibus Ethernet controller connects Multibus computers to Ethernet. It consists of a single board that plugs into any Multibus and connects to the coaxial cable via a transceiver cable and Ethernet transceiver. It costs $1,250, the company said from 1390 Shorebird Way, Mountain View, Calif. 94043.

Micom Systems, Inc. introduced the Micro800/2HP, a data concentrator designed to support Hewlett-Packard Co. HP 3000 systems using 3000/View or other software relying on block mode data transmission. It supports on a single telephone line up to eight terminals that can operate in either full-duplex or half-duplex mode at speeds up to to 9,600 bit/sec.

The Micro800/2HP costs between $1,050 and $2,200, depending on the number of channels. Micom is located at 20151 Nordhoff Ave., Chatsworth, Calif. 91311.

General Electric Co. unveiled two medium-range microwave systems for data transmission. The LSD-122A and LSD-112A permit bipolar digital transmission at rates of 1,544M to 3,152M bit/sec, respectively. They provide video, data, control and telemetry transmission as part of the vendor's Gemlink line.

The microwave systems cost $12,000 and $18,000, respectively. GE can be reached at 101 Merrit, P.O. Box 5900, Norwalk, Conn. 06856. •

Tymshare Units Tap Data Bases

DALLAS — The first models in a line of interactive low-speed, low-cost "personal information" terminals from Tymshare, Inc. were unveiled here last week at Interface '82.

The Model 415 Scanset, which features a 9-in. diagonal CRT screen, full-Ascii keyboard and 300 bit/sec modem, is priced at $649. The Model 410, which does not include a modem, is priced at $495.

Tymshare, an international computer services company, said that the Scanset enables the user to dial up and log onto any of four different data bases by depressing a single key. Depressing two keys provides access to any of 32 additional data bases.

The terminal includes six "soft keys" that accommodate up to 12 functions programmable by the user or a host computer. A label identifying each function is displayed automatically along the bottom of the CRT screen above the related key.

Other Scanset features include:

- A 24-line black-and-white screen which can display either 40- or 80 char./line.
- Limited graphics capability. An "alphamosaic" graphics character set is provided, along with a standard Ascii set and a third set containing financial and other special symbols.
- A port for a peripheral printer, which is "to be announced," the company said. Another enhancement, reportedly due within three months, is a built-in telephone handset.

The Scansets are expected to be used in offices, manufacturing plants, banks, hospitals, warehouses, retail stores and in the home, according to a Tymshare spokesman. The terminals can also be used in store-and-forward electronic mail applications, he said.

Tymshare is based at 20705 Valley Green Drive, Cupertino, Calif. 95014.

Most Pressing Issue Faced By Communications Users?

By Bruce Hoard
CW Staff

DALLAS — What are the most pressing issues faced by data communications users?

"Probably office automation," said John Lucas, major account consultant with United Telephone Co. of Indiana. Lucas was among a group of Interface '82 attendees asked that question here last week; their replies showed the diversity of telecommunications concerns facing their companies.

United Telephone is interfacing word processing and electronic mail to its IBM mainframes. "We're trying to develop software to interface IBM word processors to our IBM mainframe," Lucas observed.

Larry D. Mason, software engineering specialist with General Dynamics Corp. in Fort Worth, Texas, is looking for more throughput. "We're always logging down when it comes to transporting data from one place to another," he said, despite the fact that General Dynamics is using a 56K bit/sec communications satellite link.

Most pressing issue? "There are a lot of them," another attendee sighed. He asked to remain anonymous because his firm is shopping for local-area networks and he does not want to be besieged by anxious vendors.

"We got tons of them," replied Larry Lebo, staff administrator with GTE Service Corp. High on his list was more high-speed bulk data transfer even though the company is running a 1.5M bit/sec satellite link between two of its data centers.

Robert Perrotta, vice-president of the National Bank of Commerce, a bank holding company, said his company is trying to tie together a network of banks in southern Texas and, "It's happening too fast. We're trying to slow things down a little bit." He is interested in buying network diagnostic equipment and "all kinds of terminals."

Canadian service bureau owner Marc Gagnon complained of the high cost of leasing telephone lines in his country, but "I don't think there is any solution to that because we're too small." Nonetheless, his company, Mathema, Inc. of Montreal, is trying to circumvent the high costs of leased lines by installing minicomputers on customer premises.

Jeff Landig, an analyst/programmer at International Paper Co. in Dallas, apparently agreed with Gagnon about high costs. "We've found that time-sharing services are eating us alive, and we're going with minicomputers," he said.

"At this point, an on-line accounting system" is the most pressing problem of Tyrone Jones, supervisor of computer operations, University of Texas Health Science Center in Dallas. The school is looking at several packages and also is considering a higher speed printer than what it currently uses.

Protocol Converters Star at Show

(Continued from Page 1)

The HTIX system costs "about half" as much as a comparable 3270 system, Askanas said. "Moreover, it allows remote dial-up access from the terminals to the HTIX and the HTIX to the host — vastly improving network flexibility."

The T8 HTIX is offered in 8-, 12- and 16-port versions; they are priced at $10,950, $13,950 and $16,950, respectively.

Datastream is located at 1115 Spacepark Drive, Santa Clara, Calif. 95050.

Using the protocol conversion facilities of a public packet-switched network to link synchronous and asynchronous equipment, according to Icot Vice-President Joseph Becker, means the user typically pays a monthly port charge of $500 to $1,500 plus traffic charges for each asynchronous terminal linked to a packet network.

The Icot 251, which is a multiplexer/concentrator as well as a packet assembler/disassembler, eliminates the port charge, Becker said. In addition, an asynchronous terminal reportedly can communicate with an Icot 251 over dial-up access lines at speeds up to 9,600 bit/sec compared with a maximum 1,200 bit/sec for carrier-provided facilities, according to Becker.

The 251 is offered in two versions. One supports four asynchronous remote terminals and is priced at $2,850. The 8-terminal model costs $4,200.

Icot is headquartered at 830 Maude Ave., Mountain View, Calif. 94043.

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'Internetting Can Make or Break Net,' Sytek Director Tells Conference Session

By Bruce Hoard
CW Staff

DALLAS — "Internetting can make or break a network," Sytek, Inc.'s Robert R. Shatzer said during a session on local-area network gateways at the Interface '82 conference here last week.

Local-area networks should not be considered as stand-alone entities, but as part of an overall integrated data distribution system, Shatzer — the director of product line for Sytek's Localnet development organization — told the audience.

In order to illustrate the wide scope of applications such an overall network can serve, Shatzer volunteered a list of potential user services, including terminal-to-CPU traffic for word processing and data entry and CPU-to-CPU traffic for distributed processing and data base applications.

CW at Interface '82

Other user services that can be provided are facsimile, communicating word processing, electronic mail and teleconferencing, he added.

The most important end-to-end user concerns include transparency and economy, Shatzer declared. The user does not want to know he is internetting across networks and he does not want to spend a lot of money implementing the capability, he added.

The speed of connect and data transfer are also important to users, as are data security, access security, accessability, availability and reliability. The user wants to be able to use the network just as easily as he might plug an ac-power plug into a wall. And the system must be "always up and available," the director noted.

Internetting Concept

To illustrate the internetting concept, Shatzer displayed a chart in which small local-area networks were linked to large local networks, which were in turn tied to metropolitan networks, which were finally linked to long-haul networks.

He defined a small local-area network as an intraoffice subnet based on a private branch exchange (PBX), baseband or broadband cable system or telephone company local loop. A large local network was characterized as an interoffice subnet built in a building or around a campus, also based upon a PBX, baseband or broadband cable system or telephone company local loop.

The metropolitan-area network being fed into the local networks was described by Shatzer as consisting of telephone company lines or a broadband cable TV system that may be used for such enhanced purposes as videotex or digital termination services.

Lastly, the long-haul network depicted on the chart was a combination of several large networks built around long-haul telephone company lines. Pointing to the overall local to long-haul network, Shatzer said: "You have a continuum of services that need to be bridged one to the other." He added that these "heterogenous" networks must be connected cheaply, easily and with flexible techniques.

Other user concerns he mentioned included physical connectivity — the actual linking of one transportation media to another. The higher levels of communications protocols are "more subtle" and if not properly established, can leave the user in a position analagous to making a call to West Germany and not being able to speak German.

Congestion at the gateway between networks can be another problem, he said, observing, "It calls for a little judicious system designing." Other potential problems are access security and access contention.

Shatzer referred to addressing as "the most critical issue in internetting" and said there is not yet a firm solution to its demands, although Xerox Corp. may be coming up with something.

The director suggested an addressing scheme similar to the one used by Xerox's Ethernet local-area network. The problem with global administration as used by Ethernet is finding someone to take responsibility for it on a satisfactory basis, he explained.

According to Shatzer, global administration can lead to security leaks and is also a problem when one box with its particular serial number is removed from the network.

Gateway address translation and billing are two more sticky issues, Shatzer said. The gateway has to be aware of different addresses, and billing has to be passed down from the long-haul and metropolitan networks to local-area network users, he said.

In conclusion, Shatzer said: "The user doesn't really care about internetting. It's our problem."

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Roberts, Karp Given Awards

DALLAS — Dr. Lawrence G. Roberts received the Interface Award for his contributions to the development of packet switching technology at the Interface '82 conference and exposition here last week.

Interface '82 was sponsored by *Business Week* and *Data Communications* magazines and organized by the Interface Group of Framingham, Mass.

Roberts was cited for his work with the Defense Department's Arpanet packet-switching network and his efforts with GTE-Telenet developing the X.25 international standard packet-switching interface protocol.

Harry R. Karp was presented with the award for the best Interface conference paper. Karp was the founding editor and publisher of *Data Communications* magazine, which co-hosted the banquet along with the Interface Group.

NRMA Meet Set for May 9

COPENHAGEN, Denmark — The fourth annual International Retail Systems and Electronic Data Processing Conference, conducted by the National Retail Merchants Association (NRMA), will take place here May 9-12.

Case-study presentations on successful applications will be featured at this event, including user experiences with point-of-sale, merchandise planning, control, distribution and replenishment and alternatives in the use of marking ticket technology. Panel sessions will cover such topics as in-home shopping, personal computers, credit card reader technology and ticket scanners. Retail representatives will be on hand from Chelsea Girls Ltd. of London, H.M. Hennes and Mauritz of Stockholm and PKZ Burger-Kehl of Zurich, to discuss their integrated on-line applications.

Registration costs $430 for NRMA members and $570 for nonmembers. One-day-only rates are set at $215 and $285, respectively. Additional details are available from John Chay, Information Systems Division, NRMA, 100 W. 31st St., New York, N.Y. 10001.

Local Net Just One Component

'Multiple Mixed Modes' Networks Forecast

By Bruce Hoard
CW Staff

DALLAS — A new concept in networking is emerging, and the local-area network is an integral component rather than the be-all and end-all of this concept.

That was the message presented by Dr. Howard Frank, president of Contel Information Systems, at the Interface '82 conference here last week. Frank traced the history of local-area networks and scorned the hyperbole currently surrounding them.

"What we can do now is build reasonably clever systems," the Contel president explained. Those systems should feature packet switching, circuit switching, baseband and broadband technologies, leading to the creation of "multiple mixed modes of communications" in which voice, data video and facsimile applications will all be facilitated, he declared.

As examples of the multiple modes applications, he cited teleconferencing, which utilizes video input and voice-actuated microphones and computer-aided design.

After the proliferation of long-haul and distributed data processing networks ended in the '70s, Frank commented, the appearance of value-added networks such as the Tymnet, Inc. and GTE Telenet Communications Corp.. packet-switching networks made it evident that local communications had been ignored. Now we are seeing a "glimmering" of what local-area networks can provide, he added, noting that it will be at least 1985 before they become sophisticated enough to serve users significantly.

Different Perceptions

Local-area networks are different things to different people, according to Frank. For instance, it is an intrafacility network to the telephone company, a network around campus to a university and the internal wiring in a building in the mind of someone who works in that building.

Local nets may also feature bus interface units that may have a transmission scheme, a "middle" to handle communications and a "back" to handle applications. Bus interface units may be attached to multiple devices or have multiple devices attached to them, he added.

Some of the nice characteristics of local-area networks include their insulation from the elements that have traditionally wreaked havoc on more exposed long-haul networks. Sunspots and thunderstorms cannot reach inside buildings, Frank observed. In addition, bit error rates are extremely low and there is plenty of bandwidth available.

"The local-area network is really emerging as the value-added network of the '80s," he said.

Frank examined the evolution of the carrier-sense line access scheme and criticized its proponents as well as supporters of alternative line access methods for focusing on technology instead of applications. "Consequently, the debates have become sterile," he said.

He also ridiculed vendor claims on television touting local-area networks as panaceas for device incompatibility. "That's nonsense," he said. Local nets only adhere to the three lowest layers of a total communications protocol. "Much of the hype is pure nonsense," he added.

Turning his attention to the baseband vs. broadband argument, he refused to endorse either, saying both have usefulness.

The Contel president said the "ultimate vendors" — IBM and AT&T — have yet to commit themselves to the local-area network market and their eventual commitment will have the effect of both legitimizing and enhancing it. The AT&T view of the local-area network market is now focused on its Advanced Communications Service (ACS), a value-added packet-switching network. Frank likened ACS to a time-sharing service for less affluent users and said that while it is a viable offering, it is not the final answer.

CW at Interface '82

Turning to IBM, Frank said Armonk is not about to back away from its centralized and distributed DP approaches in the face of local-area network proliferation. He reminded his audience that IBM has a huge installed base that will stick with the dominant computer vendor.

However, according to Frank, "this is not the solution for the long-term, integrated environment." Companies such as Rolm Corp., Intecom, Inc. and Mitel Corp. look at the local-area communications world from the private branch exchange (PBX) perspective. He said the next generation of PBXs will employ a distributed bus architecture and although they will handle a certain amount of data, the microprocessor-based hardware in them will make them as expensive as local-area networks.

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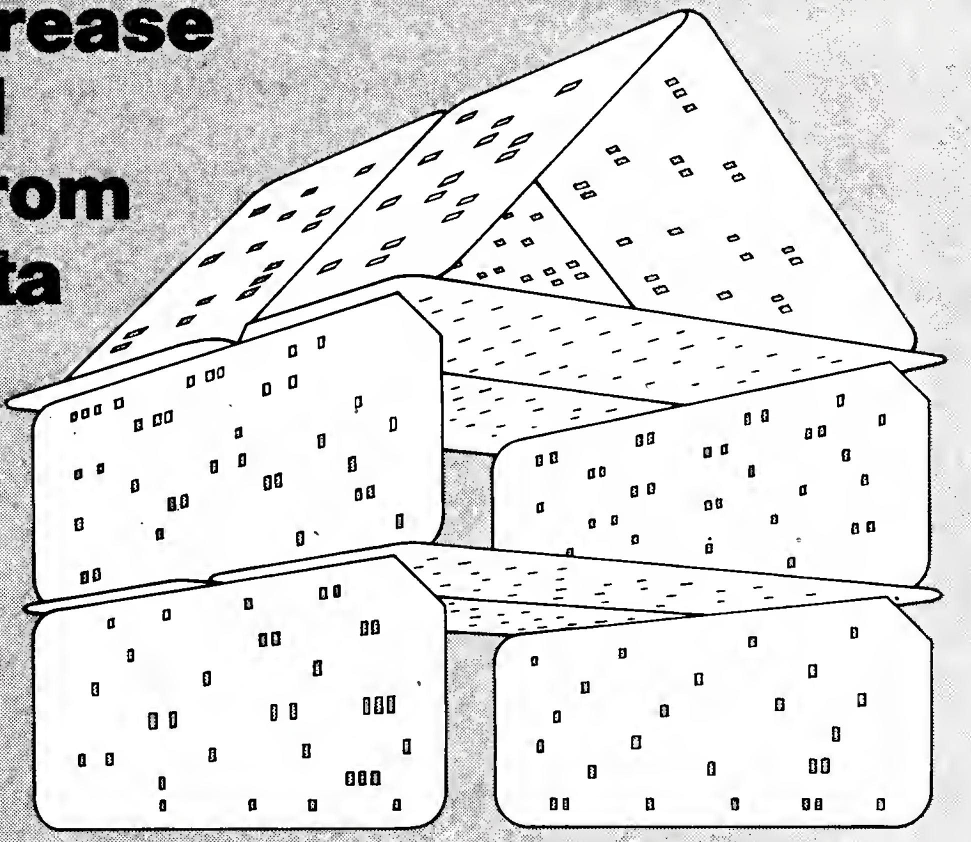

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Consultant Sees ACS Needing Two More Years

By Phil Hirsch
CW Washington Bureau

DALLAS — AT&T will need at least two years to develop fully its Advanced Communications Service (ACS), telecommunications consultant Richard Deal said here at the Interface '82 conference last week.

Deal discounted the idea that the service will be offered only to the nation's largest companies, pointing out that Satellite Business Systems (SBS) began with the same approach, but soon found the market was too narrow.

CW at Interface '82

The price that AT&T will charge for ACS is still unknown, Deal said. The phone company recently filed a tariff for Basic Packet Switching Service (BPSS), which will provide the switching and other "message transport" functions needed by ACS; the tariffed charges for BPSS indicate ACS will cost users far more than any of the competing smart network services currently available, Deal said.

Interviewed after the conference session, a former Federal Communications Commission official explained why. ACS will not be priced to make a profit, he explained, pointing out that since it will be unregulated, the FCC cannot object.

AT&T is overpricing BPSS, according to this source, in order to fend off charges that it is cross-subsidizing ACS with revenues earned by the regulated side of the business. BPSS will be provided by AT&T's Long Lines Division, he noted.

Asked whether this strategy would force AT&T to absorb substantial losses, he answered, "Yes, but only at first." As additional packet-switched services are loaded onto the BPSS backbone, the tariffed rates will come down and ACS, as a BPSS customer, will be able to reduce its costs relative to its revenue.

Another possibility, he said, is that AT&T will develop more efficient BPSS switches, which will lead to a similar reduction in the tariffed rates for that service.

Besides pricing, several other questions concerning ACS have yet to be answered, according to Deal. Among them are at least a few that could delay implementation of the service beyond June 1, the start-up date proposed by AT&T.

One such question is whether the initial ACS development program that began in 1975, and was aborted in 1979 is reflected in the capitalization plan for XYZ, Inc., the temporary name of the separate subsidiary that will offer ACS. It is also unclear whether competitors who want to supplement or support their offerings by utilizing ACS will be granted access links equivalent in quality and price to those Long Lines provides to ACS.

The Interface '82 session at which Deal spoke was chaired by consultant Charles C. Joyce, president of Network Strategies, Inc., Burke, Va. Joyce said ACS seems to be aimed primarily at applications involving communications between and among independent organizations. Transmission of orders from customers to their suppliers; insurance claims processing; medical claims processing; and airline, hotel and similar information retrieval involving multiple dispersed data bases would be typical applications.

The only ACS service offering which does not appear to be duplicated by existing public smart networks is a "customizing" option which allows the customer, using an on-premise terminal and simple Cobol instructions, to reconfigure and respecify his service in any of several ways, Joyce added.

Datapro Adds Four Seminars

DELRAN, N.J. — Four seminars have been added to Datapro Research Corp.'s spring/summer term, which will be presented May 17 through Aug. 11 in 12 cities in the U.S. and Canada. A total of 39 programs will be offered.

The four seminars are:

"Structured Maintenance: Reducing Costs With a New Methodology," a two-day seminar to help software people deal with the disciplines and techniques of maintenance costs. The seminar will be presented in New York, May 24-25; San Francisco, June 10-11; and Chicago, June 28-29.

"Microcomputer Systems: a Guide to Selection and Application" is designed to help managers and technical staff consider properties of certain information processing systems that affect applicability of microcomputer-based systems. The three-day seminar will be held in New York, May 17-19; Chicago, June 21-23; and Dallas, July 12-14.

"Data Administration: Successful Techniques" provides a comprehensive explanation of all aspects of the data administration function within the DP system and as part of the overall corporate structure. The two-day seminar will be held in New York, May 17-18; San Francisco, May 24-25; Chicago, June 28-29; and Washington, D.C, July 8-9.

"Using CAD/CAM [computer-aided design and manufacturing] Systems: Planning, Equipment Selection and Applications" is a two-day seminar designed to introduce managers, engineers and DP specialists to the benefits, technology and applications of CAD/CAM. The seminar will be presented in New York, June 7-8; San Francisco, July 8-9; and Chicago, Aug. 9-10.

Cost of a seminar is $640 for current Datapro subscribers and $690 for nonsubscribers. Datapro is located at 1805 Underwood Blvd., Delran, N.J. 08075.

Plans Finalized For EFT Expo

WASHINGTON, D.C. — The Electronic Funds Transfer Association (Efta) will sponsor EFT Expo in Dallas, May 16-19.

At one panel discussion, representatives from American Express, Mastercard International and Visa will discuss plans for debit cards and shared automated teller systems. Another panel discussion will explore the development of technical standards to support new and expanded automated teller machines (ATM) shared systems.

Other sessions scheduled for the conference include:

- A discussion of the Federal Reserve's plans for a new and improved nationwide data communications system that could serve as a possible link for all ATMs.
- A review of ATM shared-system security concerns.
- A discussion of methods for smaller financial institutions to participate profitably in nationwide shared ATM systems.

Registration fees are $325 for Efta members, $450 for nonmembers. Efta is located at Suite 800, 1929 Vermont Ave. N.W., Washington, D.C. 20005.

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Emerges Unscathed

McGill Takes Bell's Case to Skeptical Cbema

By Jake Kirchner
CW Washington Bureau

MIAMI — AT&T took its case last week for a free rein in an unregulated marketplace directly to representatives of the computer industry — Bell's most reluctant competitors.

Like Daniel in the lion's den, AT&T Vice-President Archie McGill emerged relatively unscathed from his meeting with the Computer and Business Equipment Manufacturers Association (Cbema). But the association's members made it clear that they remain extremely skeptical of AT&T promises to compete on a fair and equal basis for the billion-dollar computer communications market.

"The dust . . . really hasn't settled yet," McGill said of the proposed settlement of the U.S. vs. AT&T antitrust suit. McGill, in charge of AT&T business marketing, said that he is optimistic about Bell's future under the proposed settlement, although its provision to divest AT&T's local operating companies "is not what we sought.

"The [proposed] consent decree blows away much of the uncertainty that clouded the information business," he said. But referring to continuing congressional attempts to restructure AT&T through telecommunications legislation, he added that "not all the clouds over our industry have disappeared."

The Senate's already passed bill and the House of Representatives legislation now nearing completion both place "incredible restrictions" on AT&T, according to McGill. The House bill "would virtually hamstring AT&T and would subject the entire telecommunications industry to increase regulation," he said.

"It would also limit our ability to raise capital; it would expand — even further than today — the [Federal Communication Commission's authority over our business," McGill said.

Stating that "you can't legislate technology," McGill reiterated AT&T's position that the legislation should be delayed until the proposed restructuring of the company is completed by the Justice Department and the courts. "The bills in Washington treat our businesses as it was, not as it is about to be under the new decree," he said.

Particular Dismay

McGill said that he was particularly "dismayed" that Cbema supports immediate legislative action [CW, March 15]. He urged the association membership to wait until the settlement is implemented before supporting any attempt to rewrite the 1934 Communications Act. "There are several public policy issues that remain unanswered.

"The role of competition, the role of regulation and the jurisdiction of the FCC are three that come to mind," McGill said. "I believe Congress will want to delve deeper into the determination of the issue. However, the decree — the impact of which has hardly begun to be felt — should not be overlooked. The wisdom of trying to pass a law based on how things used to be is lost on me."

Referring specifically to the most recent draft of the House bill, McGill said, "I would challenge you to run a business under that bill." The Cbema audience proved to be a hard sell, however, with one member commenting to McGill that the unregulated Bell subsidiary proposed in the current AT&T restructuring plan is worrisome because of its possible size and financial backing from the AT&T parent.

McGill responded that the capitalization of the subsidiary would be relatively "insignificant" and said "I wish we had the unlimited financial backing you all presume we have."

But speakers following McGill at last week's meeting remarked that the proposed settlement arrangement leaves unresolved a number of issues critical to the future health of the computer industry.

Dr. Joseph A. Boyd, Harris Corp. chairman, for example, noted the number of patents covering many areas of the DP/telecommunications industry that are held by AT&T's Bell Laboratories.

"This patent portfolio," which, Boyd said, includes more than 6,000 patents from the past 12 years, may no longer be readily available to other companies for licensing under the terms of the settlement. "You can be sure there's another 6,000 right behind them and it's those 6,000 that's going to kill us," Boyd said.

He explained that many of Bell Lab's coming products will be the result of research carried on during the previous years, when the organization was supported by monopoly-produced revenue. "It would be impossible for us to catch up," he suggested, if AT&T is allowed to exploit those research results in an open, nonregulated marketplace.

Honeywell, Inc. President Stephen G. Jerritts said that pending House legislation has the potential to be the "forward-thinking legislation" the computer industry needs "to thrive in the 1990s."

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Weather Predictions All Wet; Communications Errors Blamed

By Jim Bartimo
CW Staff

WASHINGTON, D.C. — There have been some changes in the weather this year, but those who rely on the National Weather Service's worldwide predictions know that the changes have not been made by Mother Nature — a computer communications problem is at fault this time.

When the headquarters for U.S. weather prediction traded in its IBM 360/40 for an IBM 4341, some inaccurate and incomplete weather predictions were made for the nation and overseas.

To compound the problem, the United Nation's World Meteorological Organization converted to a new code for gathering and transmitting information from major cities around the world, according to Joe Friday, deputy director of the service. "The codes were made more complex," he said. "They are a way of allowing the world's weather services to communicate in a language we can all understand."

Most of the inaccuracies surfaced in temperature listings given to the media for weather columns in national newspapers, Friday said. These columns list the high and low temperatures for cities around the world.

Locating Errors

The change of computers and the new code are both related to the communications end of weather prediction, Friday said: "It was difficult to determine if the errors were in the new codes or in the new computers. It turned out to be a combination of both."

The weather service uses three IBM 370/195 mainframes for its prediction duties, and they, too, are in line for upgrading this summer. Following the example of the European weather service, the U.S. service is now searching for a high-speed scientific system such as a Cray Research, Inc. computer, according to Friday.

"Up until last year we had the most accurate weather service in the world until Europe increased their computing power. Given all that power, we could do much better," he said.

Weather prediction is one of the most difficult computer applications, Friday pointed out. It is the charting of a highly fluid substance with many variables — the atmosphere. One of the first computer applications was in weather prediction and it remains one of the last frontiers of computing.

"The first application of computers to weather prediction took two-and-a-half days to complete," Friday said. By then, the day for which they were predicting had already passed.

'Well, Rogers, I See You've Got the Office Automation Project Well in Hand.'

Winners Announced In CW Button Contest

By Susan Blakeney
CW Staff

FRAMINGHAM, Mass. — "Holy Macro!"

"Floppies need more support!"

No, that's not idle chitchat between Batman and Robin. Those are just two examples of the sense of humor demonstrated in *Computerworld*'s annual Ridiculous Button Contest.

Now in its third year, the contest strives to make the computer industry laugh at itself by turning its esoteric adages into iconoclastic cliches. More than 2,000 entries were received this year, but only a half-dozen were deemed clever enough by our biased judges to be named winners. The selected slogans will be made into pins that will be given out at CW trade show booths.

Of this year's six winning entries only one was lewd and lascivious and appealed to prurient interest. That is the same number as last year. The other five winners appealed to other forms of interest.

In the cases of duplicate entries, the revered CW judges lumped them all in a hat and plucked out the lucky contestant.

Enough said. This year's winners are:

- "Don't byte off more than you can queue," by Karen Thompson, SC Data Center, Inc., Monroe, Wis.
- "Someday my prints will come," by Mary M. Ostrum, AFNB Technical Library, Indianapolis, Ind.
- "Floppies need more support," by Hunter D. Sholar, Howell Steel Services, Inc., Weldon, N.C.
- "Loose bits sink chips," by H. Richard Neuville Jr., Pera, Portsmouth, N.H.
- "Holy Macro," by Bonnie Denkins, New Britain Tool, Cary, N.C.
- "I got a code in my nodes," by Michael Glass, Fermilab, Batavia, Ill.

For their efforts, the winners will receive "Certified Funny Person" certificates, suitable for framing, along with hand-held computer games, suitable for holding.

The runners-up, who will also become certifiably funny people, are Robert Davidson, San Diego, Calif.; J.P. Jackson, Lansing, Mich.; Debbie Jones, Rockford, Ill.; Ron Rolfer, Olympia, Wash.; Paul L. Hastings, Charlotte, N.C.; Art Brown, Louisville, Ky.; and Alice W. Campbell, Charlottesville, Va.

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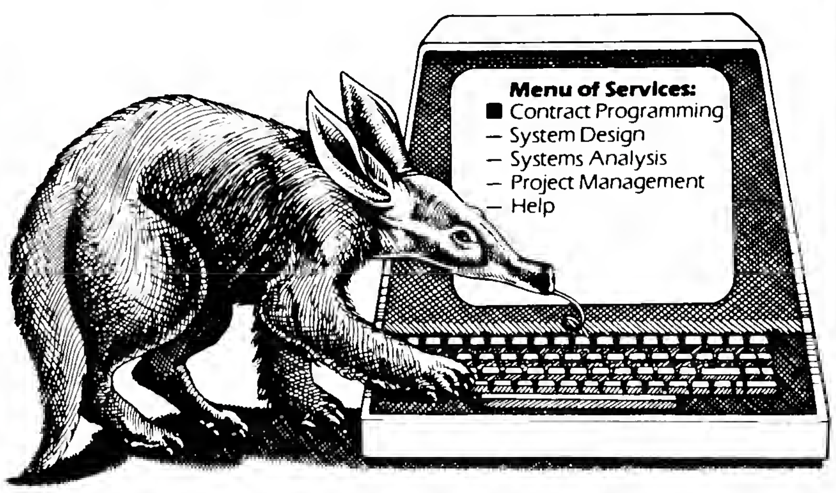

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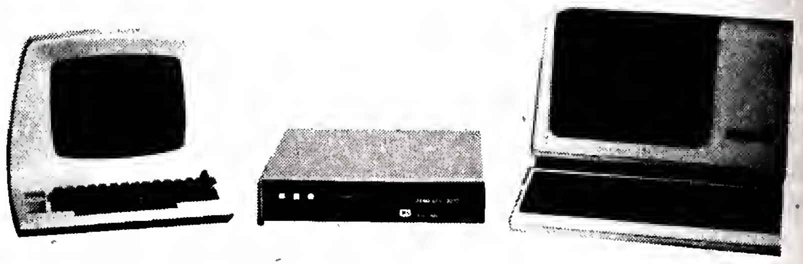
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Data Security Threat 'Exaggerated'

Reports of 'Break-In' Technique Called 'Hype'

By Jeffry Beeler
CW West Coast Bureau

BERKELEY, Calif. — A highly publicized "break-in" technique that came to light recently at the University of California here may pose less of a threat to data security than some computer crime experts have claimed.

Reports that the technique constitutes the most serious data security problem ever discovered are greatly exaggerated, according to the university's computing director Stuart Lynn, who dismissed the reports as "hype."

Lynn readily acknowledges the technique's potential dangers and credits it with being both relatively easy to use and applicable to a wide assortment of systems environments. "But I don't think it necessarily qualifies as the most dangerous security threat in computing history," he added.

Lynn's assessment differs sharply from the purported remarks of SRI International, Inc. consultant Charles Wood, who has been widely quoted as having said the break-in technique ranks as the most significant data privacy problem yet uncovered. Both Wood and his SRI colleague, computer security expert Donn Parker, were traveling internationally when this story went to press and were unavailable for comment.

Potentially Dangerous Technique

At the center of Wood's and Lynn's apparent disagreement is a potentially dangerous break-in technique that reportedly enables a user to tap a host processor's data files by secretly gaining access to another individual's terminal.

Using the technique, an unscrupulous operator at, for example, one terminal, could enter a command into a second terminal's buffer memory and, at the same time, suppress the receiving unit's display screen. A user of the second terminal would, therefore, have no way of knowing that the workstation was being illicitly "borrowed" by someone else.

After secretly entering a command into the receiving terminal's buffer memory, the operator could "tweak" the display unit to relay the instruction to a host processor. There, the operator could then transfer funds without authorization, gain access to confidential files, modify data clandestinely or otherwise execute illegal transactions.

To the host mainframe, the incoming command would appear to have originated at the intermediate workstation, not at the first terminal, its true source. The result is that the break-in technique effectively allows would-be systems intruders to conceal their identities by "posing" as other users.

A wide range of processor models and operating systems are potentially vulnerable to the technique, which can be used in almost any computing environment that has an interterminal communications capability and the right types of intelligent Ascii workstations, according to Lynn.

Lynn declined to say exactly which terminal models or types were most susceptible to the break-in technique. But he did indicate that the technique is made possible by "certain kinds of terminal features that have no good reason for existing."

On a positive note, the university computing director characterized the technique as a problem that "hardware manufacturers can fix fairly easily." In some cases, a remedy may be as simple as modifying a terminal's read-only memory or other parts of its internal circuitry.

Another possible antidote for the break-in technique is to revise parts of a vulnerable user's operating system, "but I don't favor that option as a first line of attack," Lynn said.

"For one thing, an effort to solve the problem at the operating systems level might not always work or might call for major surgery. Besides, any fix that's implemented entirely in software can easily be undone."

As far as anyone can tell, the break-in technique in question first came to public attention last year when it was devised by an unknown University of California computer science student. Although the exact circumstances of the discovery remain a mystery, one fact is known for sure: The technique was discovered on a Bell Laboratories, Inc. Unix-based system used exclusively for teaching purposes.

"The system is isolated and is in no way associated with any of the university's research or administrative operations," which are performed on other hardware, Lynn said.

A brief description of the technique and its possible uses was later entered into the teaching system's electronic bulletin board, where it finally caught the eye of the university's computer science faculty.

Not long afterwards, news of the technique's discovery began to appear in wire service reports and in daily newspapers on both the East and West Coasts.

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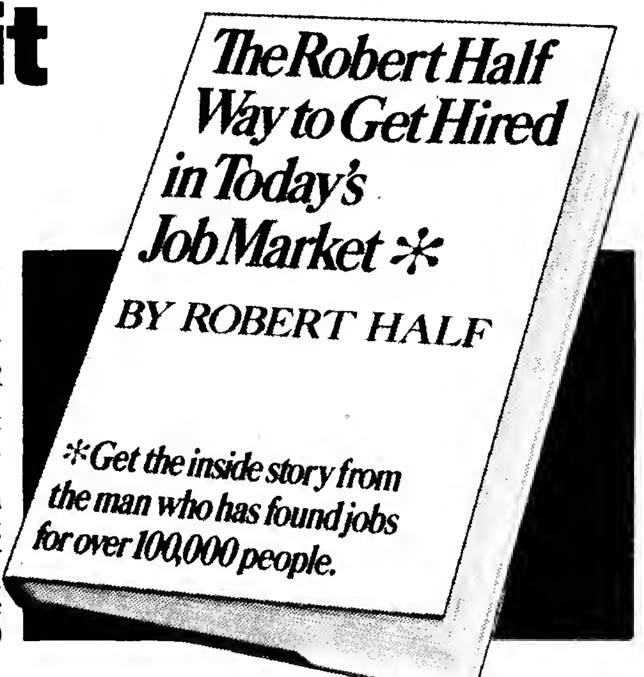
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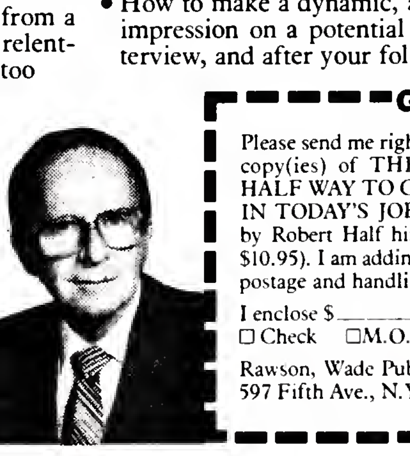

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But Is It Really Working?

Sante Fe Railway Travels Along New DP Lines

The Atchison, Topeka and Santa Fe Railway Co. was chugging along with conventional data processing methods until a new breed of railroad executives came along and decided they needed some new methods of running the railroad yard.

"We need a program that can do these things," the young executives told the data processing department.

"We already have a three-year backlog of applications," the data processing department replied.

So the new breed of railroad managers went looking for a way that would allow end users to develop their own programs. A computer vendor, Sperry Univac, gave them a fourth-generation language and a small machine.

"It will never work," the data processing department declared. "It won't last one month."

Today the Santa Fe railroad is the largest Univac installation in the country. It has increased programming productivity by 1,000%.

— A parable told by James Martin at a recent seminar in Boston to illustrate the effect of fourth-generation languages on end-user programming

By **Jim Bartimo**
CW Staff

TOPEKA, Kan. — But has end-user programming truly improved data processing for the Atchison, Topeka and Sante Fe Railway Co.?

William L. Paul, vice-president of information systems for the railroad, explained that on any given day the firm keeps track of 90,000 freight cars in the Southwest and Midwest. Prior to March 1976, manual methods were employed to monitor the inventory of cars, the shipper's name, the commodity shipped, where it was being shipped and other special instructions.

Then a fourth-generation language from Univac called Mapper was given to the end users in the freight yard. "There weren't adequate resources to do the kind of applications that needed to be done," Paul said of the DP department. "We saw how Univac was using Mapper to schedule the shipping of mainframes all over the world, and we thought it might work for us."

Employees in freight yards from Dallas to San Diego had been typing and keypunching information, which included scheduling the departure and arrival of trailer-truck assemblies. Now, all of the data is available on the freight yard CRT terminals. When the Operation Expedite system is complete, 2,400 terminals and printers will be available to the freight yard employees and other departments of the railroad, Paul said.

Relational Data Base

The scheduling of the "intermodals" (freight that is between modes of truck and rail transportation) is achieved through a relational data base, contained in all of the freight yards and connected by the railroad's own microwave communications setup spanning more than 100 freight yards from Chicago to Houston to San Francisco. When a trailer truck leaves one destination, the data base makes it possible for the receiving freight yard to plan for its arrival.

"The data base is like a filing cabinet with many drawers containing files. This makes it a simple-to-use data base, especially for nonprogrammers. The data is arranged by freight yard," Paul said. Each yard maintains its own data base, but the comprehensive information is available to any authorized employee.

Using Mapper has allowed the Santa Fe railway to double its handling of trailers with about the same number of workers, Paul said.

The success of Mapper has spilled over into other departments of the railway. In addition to the operations and transportation departments using the language, the accounting, real estate and other departments also requested Mapper to develop their own programs.

"It took from six to eight people to develop the software for the first freight yard application," Paul said. "The basic program was running in about four months. It is constantly being revised and enhanced by the DP department."

Is there any resentment from the DP department? "There was a pride problem at first — a lot of negativism," Paul said. "But now there is more than enough time spent on revising and updating the end-user-produced programs."

System coordinator Stephen Anderson, who was among the group that introduced Mapper to the railway, said that he was the first Mapper programmer outside of Univac. He attributed the success of the language to its ability to reduce programming to the basics of data processing — sort, update, search and so on. "Mapper is a report-oriented software," Anderson said. "Its only real limitation is the volume it can handle."

The railroad started with one Univac 1106 mainframe and has worked its way up to three 1184s housed in Topeka. An IBM system supplements the Univac system in pinpointing the location of the freight cars. Checkpoints at various locations on the railway are also equipped with terminals and printers. According to Paul, getting the two systems to talk to each other can be awkward at times.

Another problem is that end-user-created programs using fourth-generation languages are not highly machine-efficient. "It takes a lot of hardware to make Mapper run," Paul said.

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Managers on the Move

BRAD THOMPSON has been appointed manager of data processing for Ervin Industries, Inc., a manufacturer of steel abrasives. In this capacity he will oversee operations at the corporate headquarters' data processing center located in Ann Arbor, Mich.

Prior to his recent appointment, Thompson served as senior programmer/analyst for Domino's Pizza, Inc. and in similar functions with Gallup-Silkworth, J.T. Barnes and the Farm Bureau Insurance Groups.

He is a graduate of the University of Michigan and holds a B.S. in physics.

•••

LEONARD H. JACOB has joined The Firestone Tire & Rubber Co. as director of business systems development in the Corporate Management Information Services Organization, Akron, Ohio. In his newly created position, he is responsible for business systems planning, studies and feasibilities and conducting large new systems projects for operating groups and corporate management.

Before joining Firestone, Jacob was director of systems development for Kraft, Inc., where he was employed for 18 years.

Jacob earned a B.S. in accounting from Bradley University in Peoria, Ill., and an MBA from the University of Chicago.

•••

GEORGE F. ADAM has been appointed vice-president of information services for Travenol Laboratories, Inc., a manufacturer of medical care products based in Deerfield, Ill.

Adam has been with the company two years and was director of information services until his recent appointment. He was formerly assistant director for systems development at FMC Corp., director of computer systems at Litton Industries and a national account manager for IBM.

He holds a B.A. in business administration from the U.S. Military Academy at West Point and an MBA from Golden Gate University.

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'If It Is Not in the Contract, Then It Is Not in the Deal,' Lawyer Reminds Licensers

By Lois Paul
CW Staff

ANAHEIM, Calif. — "If I give you one piece of advice today, it is this: If it is not in the contract, it is not in the deal."

With this remark, Miles R. Gilburne, a lawyer with the firm of Blanc, Gilburne, Peters, Williams & Johnston, began his session titled "Licensing of Preexisting Software Packages: A User's Perspective" at Software/Expo West, recently.

Gilburne stressed the importance of contractually nailing down functional specifications of the software package a company is purchasing.

Functional Specifications

One suggestion was that users add a clause to their requests for proposals indicating that the proposals themselves should not include anything that the vendor does not want in the document of specification. In some cases, the vendor red-pencils sections of the proposal that he feels cannot be put into the document. In this case, Gilburne said, the user is provided with information about possible areas of weakness.

Included in the functional specifications should be information about screen formats and report formats; parameters of data base management systems; incorporation of proposal; incorporation of published or disseminated specifications; all inputs, outputs and data files; error deduction capabilities; error correction and recovery procedures; and security devices, Gilburne explained.

Many vendors will not give a firm commitment on such items as response time because this varies depending on the user's configuration.

Gilburne offered a solution: benchmark tests making assumptions about the variables that would affect response times. This can yield average response times. "It can deal with the ambiguities that make it difficult to get contract agreements," Gilburne said.

"One of the most frequently found problems," according to Gilburne, is that DP professionals acquire software and then their users find it inappropriate. Therefore, he urged that users be included in the development of functional specifications. "Many times litigation arises because users are dissatisfied with the software that DP has acquired," according to Gilburne.

Obtain Firm Commitment

Gilburne suggested that users obtain a firm commitment on the timetable for installment and operation of the software package. "Insist on a warranty that the software has been through beta testing and live implementation in the field," he advised. Smaller software houses often do not have the funds to do this and, therefore, offer the software before it has been fully tested, he added.

A wise move is to make a software contract contingent on delivery of hardware that is being obtained and vice versa. "You must make sure you're contracting on a systems basis. You have to be looking at it as a system procurement," he said.

In terms of types of delivery failures, in addition to untimely delivery, there is a problem with completeness and the vendor's right to component shipment. Users, therefore, must specify whether the vendor can ship the package on a component basis, as this could seriously impact the internal application of the product.

One of the most litigated areas of the software acquisition process is vendee cooperation, Gilburne said. "There is absolutely nothing wrong with the vendor wanting the vendee to provide a certain type of cooperation," he said. The problems arise when this "cooperation" is not fully spelled out. Then, when there are problems with the software and users scream about untimely delivery, the vendor can counteract with charges that the user did not cooperate by, for example, providing enough staff to install the software in time.

The important point for users is to spell out clearly and up front, in an exhibit to the contract, a requirement that the vendor notify them in writing of any failure to comply with any "cooperation" that is necessary. Failure to notify them would preclude the vendor using this later as an excuse for nonperformance.

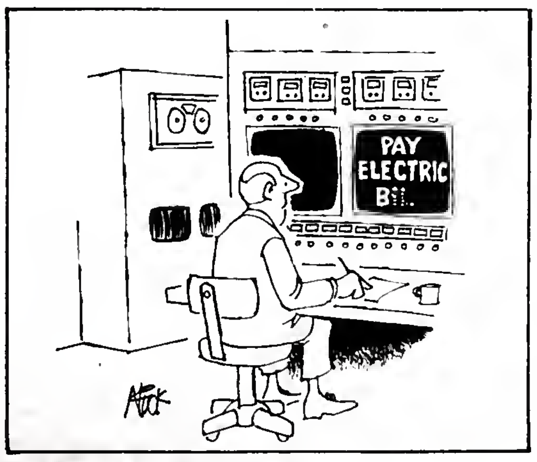
Availability of Source Code

On the subject of availability of source code, Gilburne dispelled some myths that source code escrow is the solution to the potential problem of vendors going bankrupt, leaving users with unsolvable problems. Source code escrow is intended to assure that if the vendor goes bankrupt, the source code will be released to the users.

In practice, however, it can mean lengthy delays as an escrow agent sits on the source code.

An alternative that Gilburne suggested was the concept of liquid damages up front. What this means is, if the vendor holds up the release of the materials and it later turns out that he was wrong to do so, he will be liable for liquid damages to the user.

Gilburne's final word on source code escrow was that he does not believe it will get the user the source code he needs in the event of a bankruptcy. "You must be extremely aggressive in the source code issues," he said.



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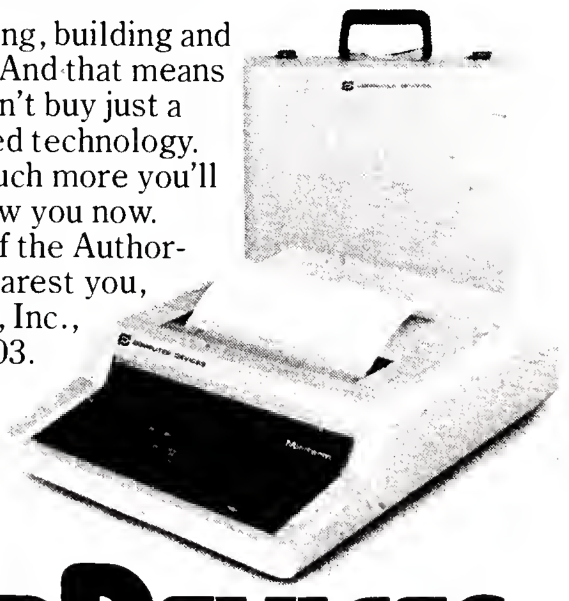

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TSI Head Cites Ways To Protect Software

By Lois Paul
CW Staff

ANAHEIM, Calif. — "I believe the best combination of protections available to users of in-house software is an employee contract, copyright notice and rigorous protection under trade secret law."

This was the conclusion of Ernest E. "Lee" Keet, president of TSI International, a division of National CSS, Inc., and chairman of the Association of Data Processing Service Organizations, Inc.'s (Adapso) software protection committee, who spoke at Software/Expo West here recently.

Keet noted four basic forms of software misappropriation:

- Theft of a complete program by employees, customers and agents.
- Duplication of a program using detailed designs/data organizations and logic flows.
- Creation of a functional simulation program based on external observation.
- Independent invention of a functionally similar program.

There are also four ways to protect software against misappropriation: contracts, copyright law, trade secret protection and patents.

The first case of misappropriation — theft of a complete program — can be protected against by using any of these four methods of protection. The second — duplication — can be counteracted by all except copyright. The third and fourth — creation by observation and independent invention — can only be protected against by the use of patents, Keet said.

Patents grant the owner complete rights to the product or invention for 17 years, but are not the right answer for software protection, Keet said. The reason is that most software is not a new process, but a method of reimplementing an existing manual process and thus not really patentable. Over 70% of all patent infringement suits settle in favor of all alleged infringers. In addition, patents are expensive, take a long time to get and are of limited value in worldwide markets, he added.

Copyright Protection

Copyright protection does not protect ideas and processes, only the form of expression, he explained. It does not preclude others from employing the designs and ideas. Software vendors, therefore, must use copyright protection in conjunction with trade secret protection. Keet noted that copyright laws protect reproduction, but not use. "If you cannot prove that the work is being reproduced, you cannot prove a copyright infringement."

Ownership of a copyright generally belongs to an employer, he continued. Therefore, written agreement with employees is practically mandatory to assure protection of the software.

There is an argument that a copyright should be sufficient to protect source and object code. Keet explained that Adapso is proposing a revision of the Copyright Law of 1980 that would include an equivalent works clause. The clause would make it a copyright infringement if, for example, the same type of software was developed using a different language. The proposed revision of the Copyright Law also would clear up the ambiguities that exist concerning copyright and trade secret law.

For example, to register a copyright it is necessary to make available a copy of the program and this violates trade secret law.

Trade secret law, which is part of common law in 25 of the 50 states, protects any form, pattern or device that can be proven to give a company a particular advantage in the market. "To prove misappropriation, you must prove the person gained access after you entered into some implied confidentiality agreement," he explained.

Trade secret protection can be used if the subject matter passes the trade secret test, if the employee is subject to an implicit agreement not to disclose and if the developer's interest in protection outweighs the employee's interest in using the information in the marketplace.

To obtain contract protection, a firm must obtain customer acknowledgment of confidentiality, trade secrets and the vendor's proprietary rights, Keet continued. A customer can be liable for damages resulting from his disclosure. It is therefore necessary for a firm to obtain signed employee and customer agreements before access to software is provided.

Keet warned vendors not to allow a hot prospect to try out the software before signing a contract.

To obtain trade secret protection, a firm must establish the value of the secret (based on the development cost), limit access to need-to-know employees and licensees and restrict the redistribution by employee and customer agreement.

Attorney Outlines Software Contract Procedures

By Lois Paul
CW Staff

ANAHEIM, Calif. — The entire software contract procedure should be approached as a partnership venture by vendors and users, according to Ronald J. Palenski, assistant general counsel for Association of Data Processing Services Organizations, Inc. (Adapso).

Speaking at Software/Expo West here recently, Palenski said that his work with Adapso has led him to the conclusion that most legal contract problems started out as management problems.

He explained the workings of the Uniform Commercial Code (UCC), which is law in all states but Louisiana, and how it applies to computer software transactions. "In the event of litigation, it is not unlikely that a court would apply UCC-type principles."

One of the most important features of the UCC is the notion of warranties, Palenski explained. Under UCC, there are two major implied warranties — merchantability (goods are what the contract and seller say they are) and fitness for a particular purpose.

Most software vendor contracts will disclaim these warranties, Palenski said, and will substitute express warranties, such as performance warranties. Palenski explained that under UCC regulations vendor disclaimers must appear prominently in contracts so users can be aware of exactly what is not included.

"From the user's point of view, the drafting of specifications is most critical," he said.

There also is a merger or integration clause, he said. In the event of litigation, under this clause everything outside the contract (prior to a written or oral contract or oral understanding) is excluded in determining what it is that the contract means.

"Be specific, it is important to determine what you want the software to do," Palenski stressed. This must be in the document.

He described a checklist for a software packaging license and what this document should contain. Some of the sections include definitions that are used, restrictions on use, documentation, support services, customer training, copyright/patent indemnity, confidentiality obligations and arbitration. Palenski repeated the importance of having each of these items spelled out specifically in the contract.

Expert Rates Modeling Languages

By Jeffry Beeler
CW West Coast Bureau

ANAHEIM, Calif. — Like the city of Cleveland, some features of financial modeling languages are badly underrated, according to Steven Thompson, an in-house business consultant with the First National Bank of Chicago.

Other features of these languages are a little like home cooking: They enjoy a widespread esteem that is frequently undeserved, Thompson added at Software/Expo West recently.

In a discussion of how to pick and use planning packages effectively, Thompson referred to two classes of modeling language features. One class, although extremely pedestrian and often taken for granted, is used extensively and thus occupies a much more important position than many users realize.

Other Features

The other class of features, by contrast, is typically considered glamorous and is often the subject of intense promotion. The trouble with the second type of features is that they seldom find their way into everyday use, Thompson said.

An example of such an "overrated" modeling language feature is the ability to manipulate esoteric statistics and to support cryptic syntax, he said. Another capability that users often overvalue is speed of execution, which Thompson characterized as being much less important than functionality.

At the opposite end of the scale lies the first group of features, which can be fairly described as "underrated," the consultant said. Typical of this class of capabilities are modeling language features such as interrupt control, selective recalculation and the ability to support multiple data types.

Also included in the underrated class of features is the ability to support both uppercase and lowercase characters, Thompson said.

In other comments, Thompson strongly urged that financial modeling systems be developed primarily by end users rather than by programmers.

One of the advantages of financial and planning models is that unlike programs, they require little, if any, technical expertise to develop. End users, therefore, can reportedly create the needed management-support tools with great speed and relative ease.

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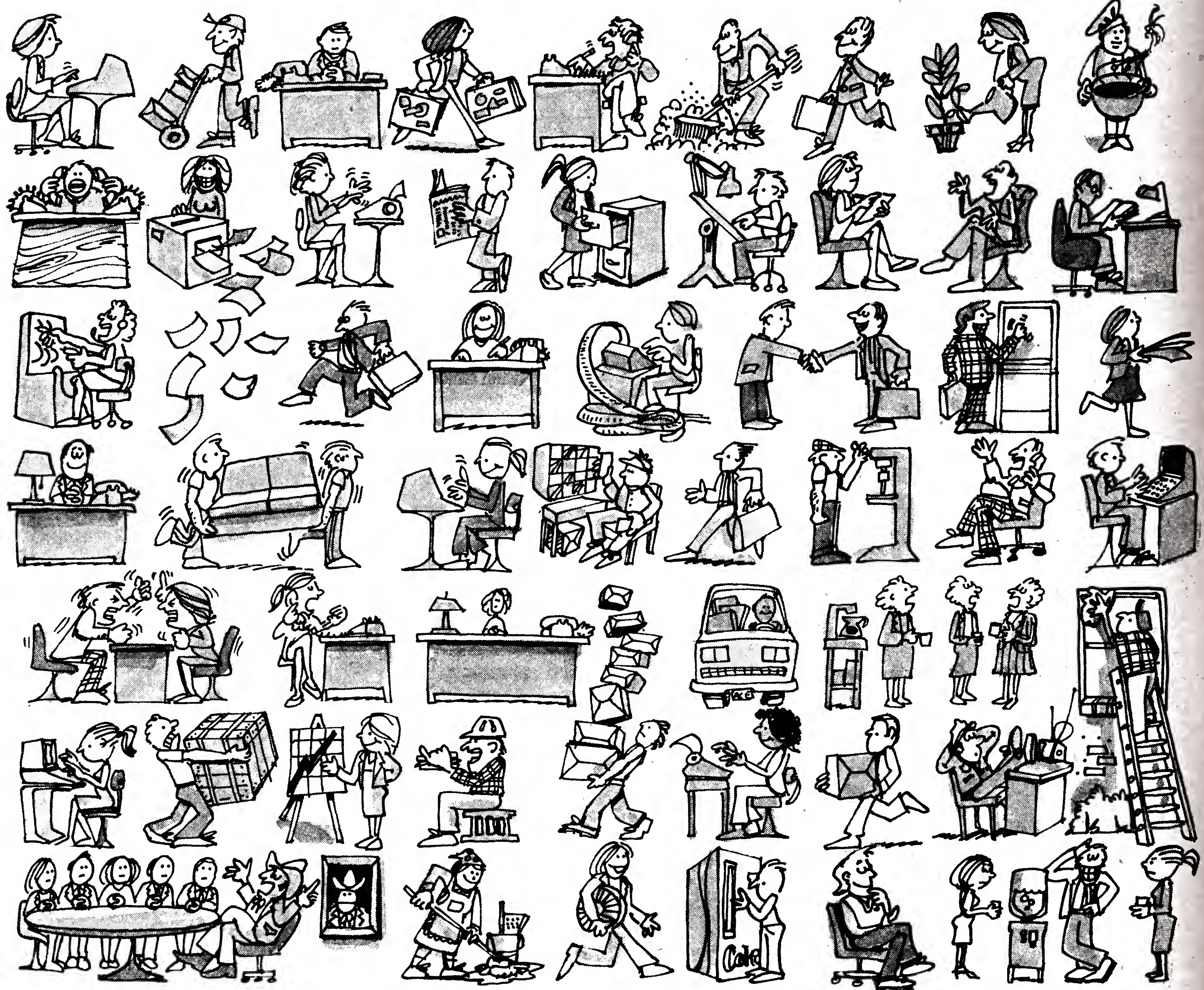

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Exec: To Boost Productivity, Change Thinking

By Jeffry Beeler
CW West Coast Bureau

ANAHEIM, Calif. — Systems managers need to adopt new tools, technologies and concepts of application development if they expect to boost programmer productivity and overcome the computing field's other roadblocks to progress.

That observation came from Cincom Systems, Inc. Chairman Thomas Nies, who addressed the recent Software Expo/West conference, formerly known as Software Info.

Reluctance by systems professionals to make "necessary changes in their mind set" constitutes the single greatest barrier to the computer field's continued advancement and prosperity, Nies said.

During a luncheon address dealing with the subject of computing productivity and performance, Nies portrayed data processing as a discipline beset with problems that "go all the way down to its roots."

Chief among the problems, he said, are:

- Declining programmer productivity, which reportedly ranks as the information-systems trade's most serious ailment.
- Growing maintenance requirements, which account for more than 70% of the typical computing department's programming budget.
- High application-development costs, which in many cases have risen fivefold to sixfold during just the last few years.

Seek New Approaches

"These problems are burying DP, and we won't get any relief if we continue to go down the same road we've been traveling in the past," Nies said. "The difficulties currently facing the computing profession can't be solved simply with the installation of a few additional software packages."

On the contrary, he added, a solution will come only if systems specialists "move away from traditional methods of building new applications."

Part of the answer to the DP business' current woes is "to start building programs in smaller chunks than we've done in the past" and then assemble the various software modules to form completed systems, Nies said.

To support his claim that thinking small can yield big dividends, the Cincom executive invoked what might be termed the "cube rule of application development."

The rule states that if the scope of complexity of a proposed system doubles, its development price tag jumps by a factor of eight. If the same project later triples its original size, the associated programming costs skyrocket 27 times.

Nies also urged information systems managers to abandon conventional application development tools and technologies in favor of their state-of-the-art successors.

"We need to increase programmer productivity by quite a bit more than 1,000%," he said. But the required improvement in output will never be achieved as long as the computing field continues to cling to familiar programming tools.

In at least one sense, Nies added, programming is a little like digging ditches. Just as the surest way to boost ditch-digging productivity is to invest in mechanized equipment, so programming output can best be increased by acquiring the latest in software-development aids.

Yet many computing-department heads apparently take just the opposite approach. They try to lick the programming-productivity problem by hiring additional programmers rather than by switching to leading-edge technology.

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Access Control, Internal Checks

DEC Technicians Told of Security Trends

By Susan Hurley
CW Staff

MARLBORO, Mass. — Access control, internal security checks and new technical trends may provide some help with computer security problems, according to a speaker from the Department of Defense (DOD).

U.S. Air Force Col. Roger R. Schell, deputy director of the Computer Security Center (CSC) for DOD in Fort Meade, Md., outlined common computer security problems and current technical trends last week at an in-house seminar for Digital Equipment Corp. technicians here.

The CSC is involved in research development and in evaluating standard products, Schell explained. Customers are primarily the Department of Defense, the intelligence community, the federal government and the private sector, he said.

In an effort to interest the private sector in computer security, the CSC will be issuing public evaluations of systems indicating their security levels, he noted.

Schell pointed out that security problems have increased as the system's environment has changed. When systems were first housed in high-security areas with security parameters consisting of guards, alarms and signals, the system did not need an internal security device.

Security Perimeter

With the proliferation of systems into unguarded areas, he said, the system "is part of the security perimeter itself.

"Vulnerability comes in a variety of flavors," Schell said.

In trying to secure a system, "there has to be some definite plan," he continued. Information must be sorted out and the computer programmed to deliver sensitive material only to those entitled to receive it.

Some available security tools include secure office terminals, limited subsystems, security packages, tougher password selection and end-to-end encryption.

"Encryption is valuable, but not an end-all," Schell said. "You still have the basic problem of relying on the computer itself for security."

A software security kernel can provide some protection, he said, since it checks every time a memory file or data file is accessed to determine whether it is going to the authorized person.

The drawbacks to using kernels are a lack of availability and the need for backup hardware, Schell cautioned.

"Reliable access control is the key," according to Schell.

Segregating sensitive information will not help, he explained, because files are still vulnerable. Patching systems is also impractical, he pointed out. An unauthorized person only needs to find one hole in a system to get information, while a designer must attempt to find all of the holes.

"The universe can end before you're finished doing this," Schell quipped.

DP Seminars To Study Law

MADISON, N.J. — A series of two-day seminars to examine legal questions involved in computer software transactions will be sponsored by the American Institute for Professional Education, a nonprofit business education organization.

The seminars, entitled "Software, a Legal Briefing for DP Professionals," will be presented in a case-study format with emphasis on problems and solutions experienced in the software field.

Topics for discussion include analysis of legal protection for software products, buying and selling procedures, reducing the risk of litigation and ownership of software modification, how to define and describe software products, potential legal remedies and techniques in the development and organization of contracts and agreements.

The seminars are scheduled for San Francisco, May 3-4; Cherry Hill, N.J., May 10-11; Indianapolis, May 17-18; Arlington, Va., May 24-25; Seattle, June 7-8; and Pittsburgh, Pa., June 14-15. Also, Boston, June 21-25; San Diego, June 28-29; Hasbrouck Heights, N.J., July 8-9; Chicago, July 12-13; Stamford, Conn., July 19-20; and Denver, July 26-27.

Registration for the two-day seminar costs $595/person.

Further information is available from the American Institute for Professional Education, Carnegie Building, Madison, N.J. 07940.

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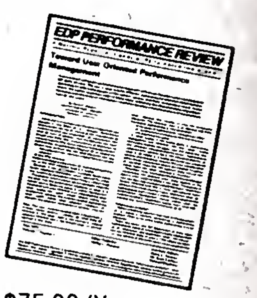

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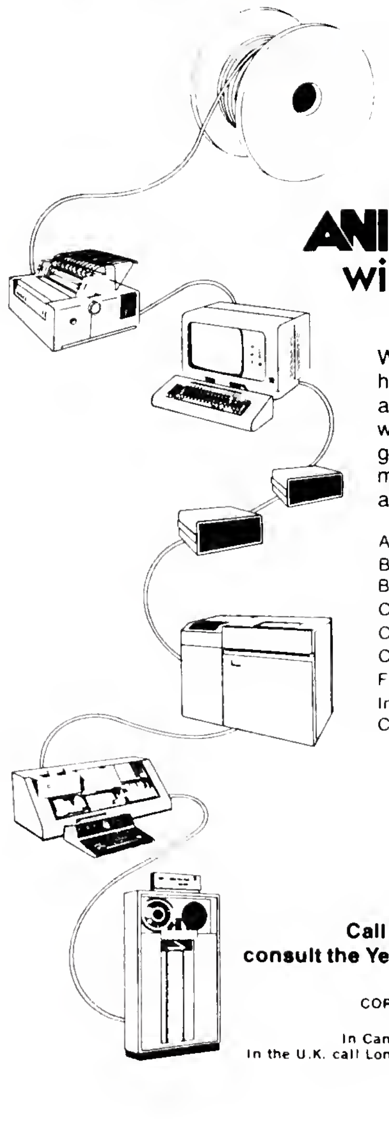

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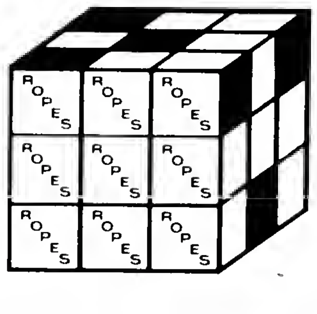

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Can Corporate Politics Be Avoided?

Turnaround Time
By Larry E. Long

Q **I am currently a senior programmer with a large insurance company. I have been employed in the DP field since I graduated from college six years ago. I realized very early I enjoy the technical aspects of DP — programming, creating catalogued procedures, testing, time-sharing, etc. I disdain the "people-work" and what passes at most installations for "analysis." These activities inevitably involve one in the internal corporate politics, which I abhor most of all.**

I am in my sixth job. Each move was made for the same reason — I deluded myself into believing the new employer would allow me to remain a programmer/technician (without sacrifice in compensation) and not involve me in the corporate politics. The results have been disappointing.

I am now so frustrated that I am very seriously considering leaving DP.

My employers and associates praise me as an outstanding programmer/technician. Are there organizations that would appreciate and utilize my strong technical ability and desire? At the age of 28, am I locked into a career that I know is wrong for me?

A There is no escape from corporate politics, in information systems or any other professional career path. Every corporation has people and, therefore, a political infrastructure. Fortunately the political infighting is less intense in some positions than others.

Seek out a company with a good system development methodology and a clear distinction between programmer and systems analyst. In this environment the analyst is the primary interface with the user (and politics), and the programmer works directly from programming specifications.

I am with you.

A person with a purely technical orientation should be able to follow a career path that encourages the maturation of his intrinsic skills. Both employee and employer would benefit.

Q **I have a rather odd composite of education, skills and experience which I have been unable to tie together. After graduating with a B.A. (1975) in economics from a prestigious university, I entered the Army and served four years as a lone infantry officer. On my return to civilian life, I obtained a reasonably good paying job (high $20s) in a short time via competitive exams; however, the work was unchallenging. When I was offered an entry-level job as a programmer with the federal government, I accepted it, even though my salary was effectively halved.**

Now I have been working as a programmer for about 21 months on industrial applications (primarily Pert and CP/M). I will have an associate degree in DP shortly and I am working on a B.S. in computer science. This has accelerated my learning and put me ahead of my peers.

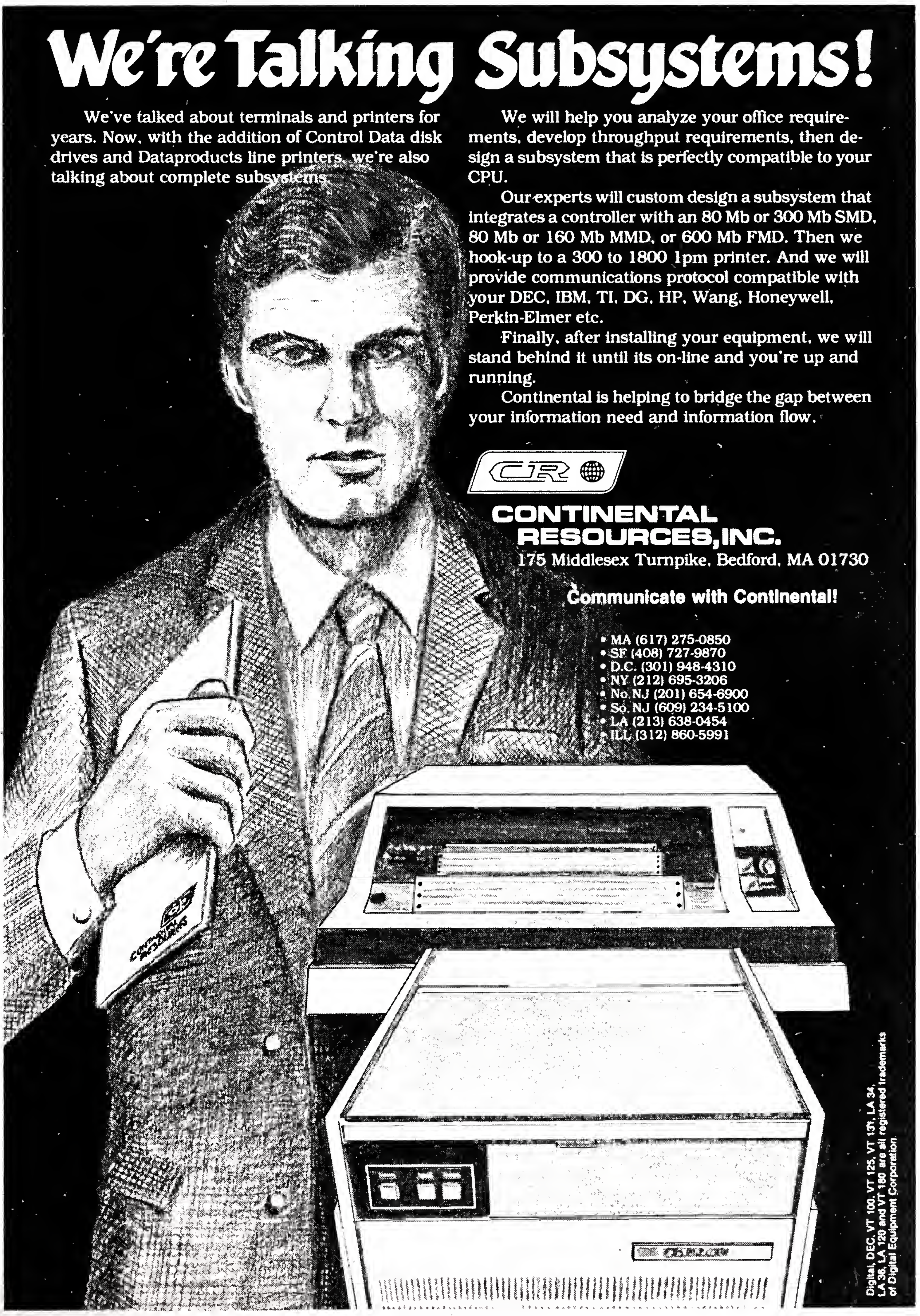
Recently I accepted a position as a programmer/analyst and part-time DP instructor at a community college. This job switch will not entail a significant pay raise. Do you think this is a wise move?

Obviously, I must have messed up somehow. My 23-year-old laborer roommate who didn't get past 10th grade is making $5,000 more a year than me! I'm 29, fairly intelligent (top 2% on Graduate Record Exam [GRE]), reasonably articulate and get along well with people. Where have I gone wrong? I eventually want to be a DP manager.

A You haven't "gone wrong," but considering your background and circumstances I believe you are barking up the wrong tree. Eventually your military experience may be an asset in managing people, but don't expect any special considerations now. The attitude of the typical interviewer is, "Oh, you were in the military, so was I," followed by a few war stories. "Now what experience and education do you have related to this job?"

Considering your computer/information systems experience and education, a B.S. in computer science will have little effect on your marketability. If you want to continue your education, look for a masters program in information systems or computer science. A master's degree may actually take less time to complete than a second bachelor's degree. It would complement your resume and appear to be a good match for your circumstances (GI Bill, mobility and high GRE scores).

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*



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System Takes Risk Out of Casino Operation

By James C. Thorsby
Special to CW‡

ATLANTIC CITY, N.J. — Streamlining business operations can sometimes be a gamble. But when the business is a casino and there is a heavy emphasis on security and government control, the odds favor the house.

Getting chips to and from the gaming tables can be a complicated affair. Harrah's Marina Hotel Casino here recently employed an IBM System/3 Model 15D processor and a forms processing package from The Standard Register Co. to keep track of chips as they leave the casino cage, the central holding area and are delivered to the tables.

The Harrah's system employs several CRTs, one matrix printer and a four-part form that provides control for accounting purposes.

With the fifth largest number of gaming tables in Atlantic City, Harrah's averages more than 1,000 requests for chip fills during the course of an 18-hour day. That is about $3 million in chips moving to and from the tables.

Prior to opening in November 1980, Harrah's discussed with Standard Register the paperwork necessary for transferring chips.

Harrah's wanted to have a computerized system, unlike the manual system in use at most casinos.

The four-part form developed by Standard Register acts as two separate documents. It is used as a chip-fill request and a chip-credit slip for removing a chip from the game.

The casino floor is divided into several sections or gaming areas. Each area has a pit clerk to operate a CRT unit and a terminal printer. The CRT terminal and printers are connected to the IBM System/3 Model 15D and, subsequently, to the cashier's cage.

All requests to obtain or return chips emanate from the gaming area. When a pit boss or floorman at the table decides a game needs money, the information is transmitted — either verbally or on paper — to the pit clerk.

The pit clerk then enters the data on the CRT terminal. This information is transferred to a terminal printer in the cage, where it is printed on the four-part form, providing the total number of chips needed and the denominations.

The cashier at the chip bank prepares the chip fill for that order. The cashier and a security guard sign the form signifying that the number and denominations of the chips fulfill the order requested.

The guard takes the chips to the table along with Parts 1 and 2 of the form. Part 3 of the form stays with the cashier. Part 4 of the form, which is only used for a credit transaction — not a chip fill — is destroyed.

Since the system was installed, Harrah's has only made one modification.

Originally, the Accounting Department wanted the chip forms stapled together for company files. The firm switched to microfilm storage of its records. Harrah's now applies a strip of pressure-sensitive adhesive instead of using staples to the backs of Copies 1 and 2 during production, and the copies are stuck together and detached for microfilming.

Thorsby is casino cage manager at Harrah's.

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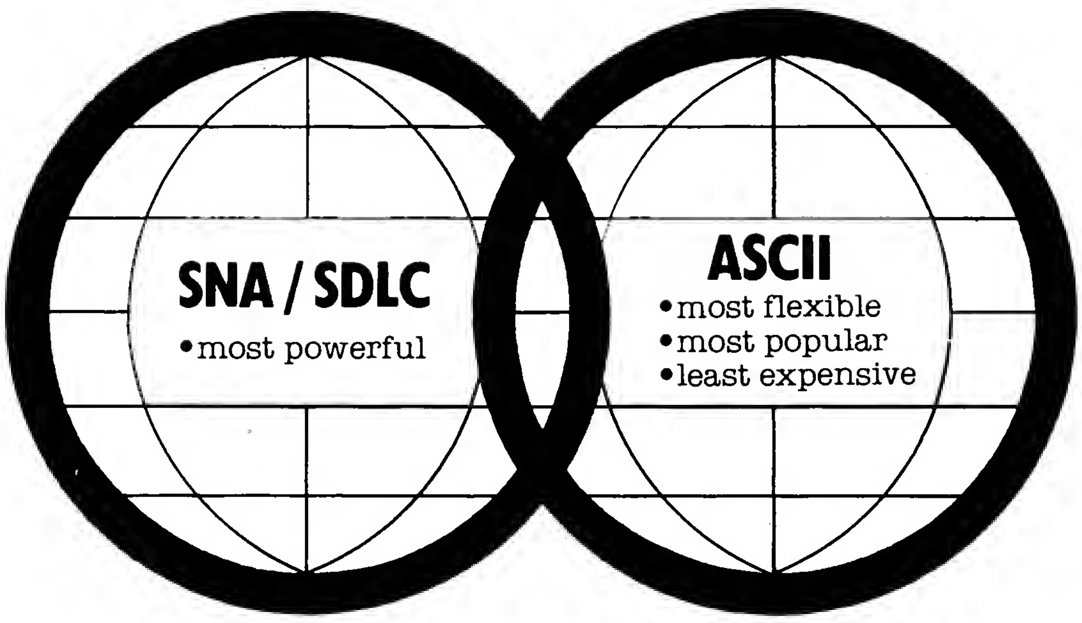

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Regional Computer Center Boasts 99% Reliability Rate

SACRAMENTO, Calif. — The earliest of the State of California's four regional computer centers boasts a 99% reliability rate, thanks partly to its giant disk memory systems.

In the late '60s and early '70s, computerization clearly enhanced the effectiveness of public programs, although the disparate and independent acquisition of DP systems by various state agencies threatened to become unwieldy.

In 1972, state law mandated the creation of four large computer centers to consolidate all state DP services. The first of these centers to begin operations — the Stephen P. Teale Data Center here — focuses on business, financial and engineering applications.

The First Avenue facility houses an IBM 3033 mainframe with 12M bytes of main memory and 16 channels coupled to an Amdahl Corp. Model 8 with 16M bytes of memory and 16 channels. There is also a stand-alone IBM 370/168 attached processor with 10M bytes and 11 channels.

The center uses 142 spindles of Memorex Corp. 3650 fixed-media disk drives and 40 spindles of Memorex 3675 disk drives with mountable disk packs to provide data storage for some 3,000 batch jobs and 100,000 on-line transactions daily.

The Ira B. Isbell Facility occupies a modern building with state-of-the-art security and substantial room for expansion. It houses an IBM 370/168 with 8M bytes of main memory and 12 channels coupled to an Amdahl V5 with 12M bytes and 12 channels. There is also an IBM 4341-M2 with 8M bytes of main memory and six channels.

In addition, 76 spindles of Memorex 3650 disk drives provide data storage for approximately 1,200 batch jobs and 40,000 on-line transactions daily. Of these 76 spindles, 16 on the IBM 4341 are installed with an Intelligent Dual Interface (IDI), which provides two independent access paths to every spindle on the string.

These heavily used systems generate a combined total of about 95 million lines of print per month and draw on a library of approximately 70,000 reels of tape, in addition to mass storage.

To provide efficient and reliable service to more than 90 public agencies with hundreds of separate facilities across the state, the Teale Data Center requires a rigorous 98% availability from its systems. Actual performance averages even higher — around 99%.

Detailed documentation of equipment performance and problems is reviewed at a daily meeting of the technical staff and equipment vendors, using several packaged software monitors, explained James A. Dole, Operations Division chief for the data center. A special meeting conducted each Friday enables the staff to plan for weekend operations as well. The two center facilities operate around-the-clock during the week and on a two-shift basis during weekends.

To ensure continued maximum reliability, the Teale Center developed a certification process for the disk memory systems procurement. In 1980, with an eye toward maintaining the technical performance it was getting at the time, the center evaluated four vendors' IBM 3350-compatible disk drives and associated hardware.

Performance criteria included total equipment availability in excess of 99.9% during the four-month certification period and average mean time between failure of no less than 2,000 hours each month.

Two of the four vendors qualified to bid and Memorex, the lower bidder, was awarded the three-year multimillion-dollar contract.

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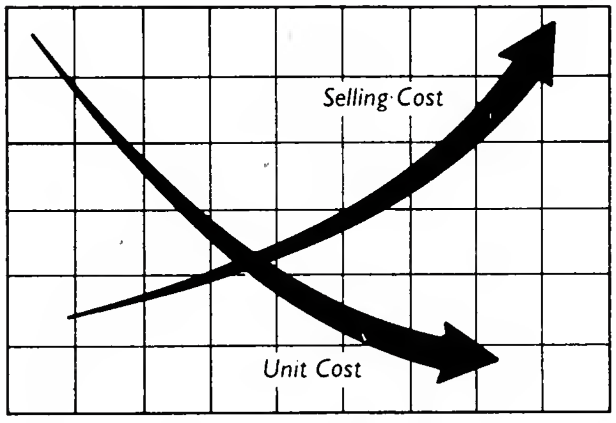

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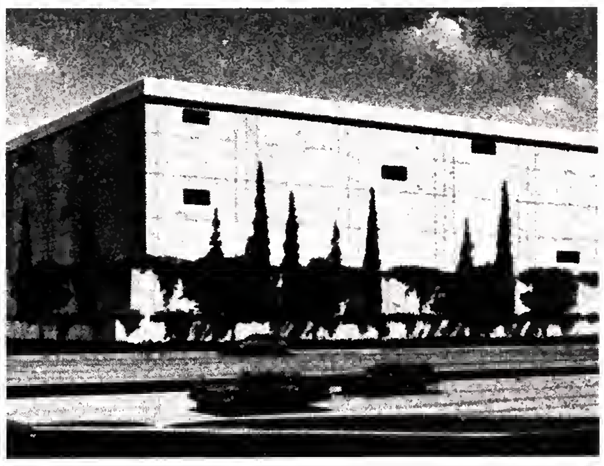

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Speaker Warns Against Dependence on DSS

By Susan Blakeney
CW Staff

CAMBRIDGE, Mass. — "Don't go out and push DSS!" was the ironic message from Michael Scott Morton of MIT's Sloan School of Management. Morton delivered the warning at the Decision Support Systems (DSS) Conference held here recently.

DSS is not new, Morton explained, because it is a software tool and a strategic method of solving problems. Conceptually, DSS has been around for 15 years, he maintained. He referred to John Diebold's (industry consultant and founder of the Diebold Group, Inc.) mid-1960s' prediction of a "marvelous computerized world" in which virtually any business decision would be automated. This is not yet the case, however, and Morton warned against thinking of DSS in this way.

Morton maintained that "DSS is in the eye of the beholder." It is basically a support system to help managers run their businesses more effectively in a wide spectrum of applications. Of the three decision-making environments in business — structured, semistructured and unstructured — Morton felt that DSS worked best in the semistructured arena.

DSS can be used in any department of an organization to help managers with strategic, operational and tactical decision making, Morton said.

Not a Panacea

But DSS is not a panacea, and Morton warned users to avoid falling into the trap of "have solution, will travel," — trying to use computer decisions when they are not needed.

Instead, Morton urged DPers to respond to the needs of others and to focus on that manager in the organization who "has got a problem and *cares.*" In fact, the only common denominator in effective DSS implementations was that every one of the users had a problem that mattered, he said.

Morton recalled the story of two DP managers that did not seem to care about user needs. These managers' departments were ignored during a DSS project. The department heads became hostile and went so far as to sabotage the projects by refusing to fix programs that did not run correctly. "You unleash one hell of a weapon when you cancel the project of a user who really cares," he argued. It is vital to acknowledge the "tremendous power" of DSS, he continued. Morton explained that the two DP saboteurs were subsequently dismissed.

The right kind of DSS implementation — a thoughtful, researched and strategic application of artificial intelligence — is just beginning to emerge, according to Morton.

In citing examples of decision support applications, Morton said that DSS can be used for information retrieval, "what if" simulation, algorithms, portfolios and more. DSS has successfully been implemented:

- In marketing, for new product planning, brand management and media selection.
- In production, for new facilities location planning, production scheduling and portfolio management.
- In finance, for forecasting the impact of mergers, acquisitions, budgeting and cash flow.
- In personnel, for long-range planning, staffing strategies and personnel selection.

In addition, DSS does not necessarily have to run on a large on-line mainframe, he pointed out. It can be used with time-sharing or on a micro as long as it is appropriate to the decision-making area.

CW Photo by S. Blakeney

Michael Scott Morton

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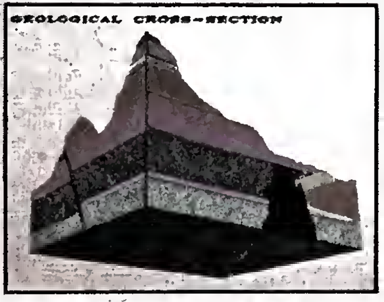

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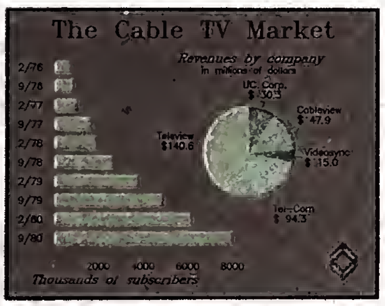

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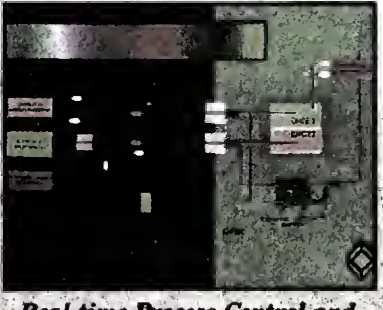
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Precision Visuals is the pioneer in graphics software tools. We have earned a reputation for doing a good job for demanding customers (our customers particularly appreciate our emphasis on documentation and support).

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"DI-3000 and GRAFMAKER have provided us with the graphics toolbox concept we had been looking for to service our timesharing customers. Resource management is critical in a timesharing environment, and we are especially impressed with the modest memory requirement and execution efficiency of both packages."

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Call for Papers

NATIONAL ELECTRONICS CONFERENCE AND NATIONAL COMMUNICATIONS FORUM '82, Oak Brook, Ill., Oct. 4-6.

The National Electronics Conference is accepting papers for presentation at its 38th annual forum. New views points on electrical engineering topics treating components, design, techniques, applications and management are invited.

Six copies of a 150-word abstract must be received by April 15. Abstracts must include title, business affiliation and characterization of the paper as original research, tutorial or application. Send to Prof. Benjamin J. Leon, Department of Electrical Engineering, University of Kentucky, Lexington, Ky. 40506.

ASSOCIATION FOR COMPUTING MACHINERY (ACM-SIGUCCS) '82, Chicago, Ill., Nov. 10-12.

ACM is accepting papers for publication in the '82 conference. Suggested topics include changing organization structure, audiences, technology, roles and responsibilities.

One-page abstracts are due April 1. Notification of acceptance will be May 1, completed copies due July 1. Abstracts and papers should be sent to: Hal Bloom, University of Chicago Computation Center, 5737 S. University Ave., Chicago, Ill. 60637.

COMPUTER CONFERENCE (COMPCON) FALL '82, Washington, D.C., Sept. 20-24.

Compcon is inviting state-of-the-art surveys, reports or analyses of existing systems and leading-edge papers. One paper will be awarded $300, and two papers will be awarded $100 each at the conference.

Areas of interest include, but are not limited to, local-area networks, city-wide/cable and radio networks, national and international networks, organizational and business issues, distributed computing, technology, network interconnection and regulation/policy issues.

Papers should be submitted in the form of an informal digest (four copies) of about 1,000 words by April 1. Accepted papers are due June 15. Submissions should be sent to Allan Weis, Compcon Fall '82, P.O. Box 639, Silver Spring, Md. 20901.

SIXTEENTH ANNUAL SIMULATION SYMPOSIUM '83, Tampa, Fla., March 16-18.

Original Papers are invited for presentation at this symposium. An award of $500 is being offered on the basis of subject, applicability, presentation and other selected judgments. Papers must not have been previously presented or published. Proposals should describe the contents and range of the paper; be a minimum of 750 words; include title, business affiliation and telephone number; and include a statement that the author personally will present the paper at the symposium. Paper proposals are due no later than May 10.

Submissions should be mailed to Linda Holbrook, P.O. Box 1548, DCF 146, Tampa, Fla. 3360l.

COMPUTER PERFORMANCE EVALUATION USERS GROUP (CPEUG) '82, Washington, D.C., Oct. 25-28.

Cpeug is seeking papers for presentation at its conference on "Improving Organizational Productivity: Improving the Effectiveness, Efficiency and Range of Automated Information Services." Papers may describe or survey state-of-the-art techniques, alternative approaches, a problem area or suggest directions for future work. In addition, tutorials are invited on basic issues, techniques and performance evaluation as well as case studies which address experimental design, data analysis methods and presentation of study results to management.

Three copies of abstracts (50 to 200 words), tutorials and case studies (2- to 3-page outline) are due April 15. Completed papers (three copies) are due June 1. Notification will be July 12. All submissions should be sent to: Cpeug '82 Program Chairman, James G. Sprung, The Mitre Corp./MS W331, 1820 Dolly Madison Blvd., McLean, Va. 22102.

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And Tandberg's operating features are just as complete. The Tandberg terminal is equipped with "soft-switches" which allow operation modes to be stored in non-volatile memory (EAROM) and changed from keyboard or line. PUSH-keys let strings of commands be implemented at the touch of one button reducing time and errors. It's an operator's dream.

The Tandberg TDV 2200 family is offered in different models emulating the DEC VT100 and VT52, Honeywell-Bull Questar and VIP 7255, Datapoint 3600 and 8200, Computer Automation CRT II, IBM 3101, Data General 6053 and D200 and others. An advanced performance model is also available for the development of application-tailored OEM terminals. So don't put up with a pain in the neck. You can increase efficiency, productivity and operator morale with a true ergonomic terminal—the only true ergonomic terminal in the world from Tandberg Data. Call or write today to: TANDBERG DATA, INC., P.O. Box 99, Labriola Court, Armonk, New York 10504. Telephone: (914) 273-6400 Telex: #137357 Tandberg Armk.

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Guide Ranks Micro Tools

EUGENE, Ore. — The "Evaluator's Guide for Microcomputer-Based Instructional Packages" is available from the International Council for Computers in Education.

The booklet includes a standard for evaluating instructional software, a summary of the Northwest Regional Educational Laboratory's evaluation process, a detailed explanation of all review components and two copies of the review form and sample reviews.

The guide is available for $2.50 from the International Council for Computers in Education, Department of Computer and Information Science, University of Oregon, Eugene, Ore. 97403.

Datapro Issues Services Guide

DELRAN, N.J. — Prepublication copies of the new *Directory of On-Line Services* are available from Datapro Research Corp. for $50 off the regular subscription price.

The directory is said to provide descriptions of more than 100 on-line services, 500 data bases and a general application, company and data base index.

Prepublication cost is $340 if ordered by April 2 from Datapro Research, 1805 Underwood Blvd., Delran, N.J. 08075.

Truck Stops Look Familiar, But Not Operation

Special to CW

WEST MEMPHIS, Ark. — Welcome to the truck stop of the future. Some things haven't changed, of course. You still smell diesel fuel in the lot by the pumps and coffee and cheeseburgers in the restaurant.

But according to D.G. Seago, chairman of Mid Continent Systems, Inc., the company's Express System software and GTE Telenet, Inc.'s Micro-Fone transaction terminal have made a fundamental difference in the way his company's truck stops do business.

"In essence, we've set up a complete cost accounting, tax payment and reporting system for our customers," Seago said, "and that's especially important in these times of high-interest rates and widespread cash-flow problems."

Stopping With Credit

Mid Continent currently uses more than 750 GTE Micro-Fones at its truck stops throughout the U.S. and Canada to transmit and verify real-time transaction data from each point of purchase to the company's Sperry Univac 90/60 mainframe here in West Memphis.

When a trucker uses his Mid Continent credit card to pay for fuel, food or supplies, the clerk simply slides the card through the Micro-Fone's magnetic-stripe reader and enters the amount and type of purchase on the 26-key keyboard.

Within seconds, Mid Continent's Univac 90/60 responds with an authorization message flashed on the terminal's LED display, indicating whether the card holder's credit is good, whether the card has been lost or stolen and whether the purchase is authorized by the customer and is within the assigned purchase limits for the trip and/trucker.

Micro-Fone Capabilities

The GTE Micro-Fone is a combination telephone/terminal that when used as a terminal operates at 300 bit/sec asynchronous and communicates over the dial-telephone network or the Telenet public-packet network. Its memory stores up to 14 telephone numbers, with word labels for expedited dialing. It has last-number-redial capability in case the user encounters a busy signal.

A distinct advantage in training new operators is the Micro-Fone's prompting in plain English, taking the user step-by-step through each transaction.

Prior to using Micro-Fone, each clerk had to spend up to two minutes per transaction on the telephone manually verifying credit. Records were kept on microfiche, updated weekly and then mailed to each truck stop.

Now each transaction (average worth is $115) is completed in about 17 seconds, and the data is captured by the computer immediately, according to David Windham, project manager for Mid Continent. As a result, productivity is greatly improved while at the same time losses due to human error, credit card abuse or fraud are practically eliminated.

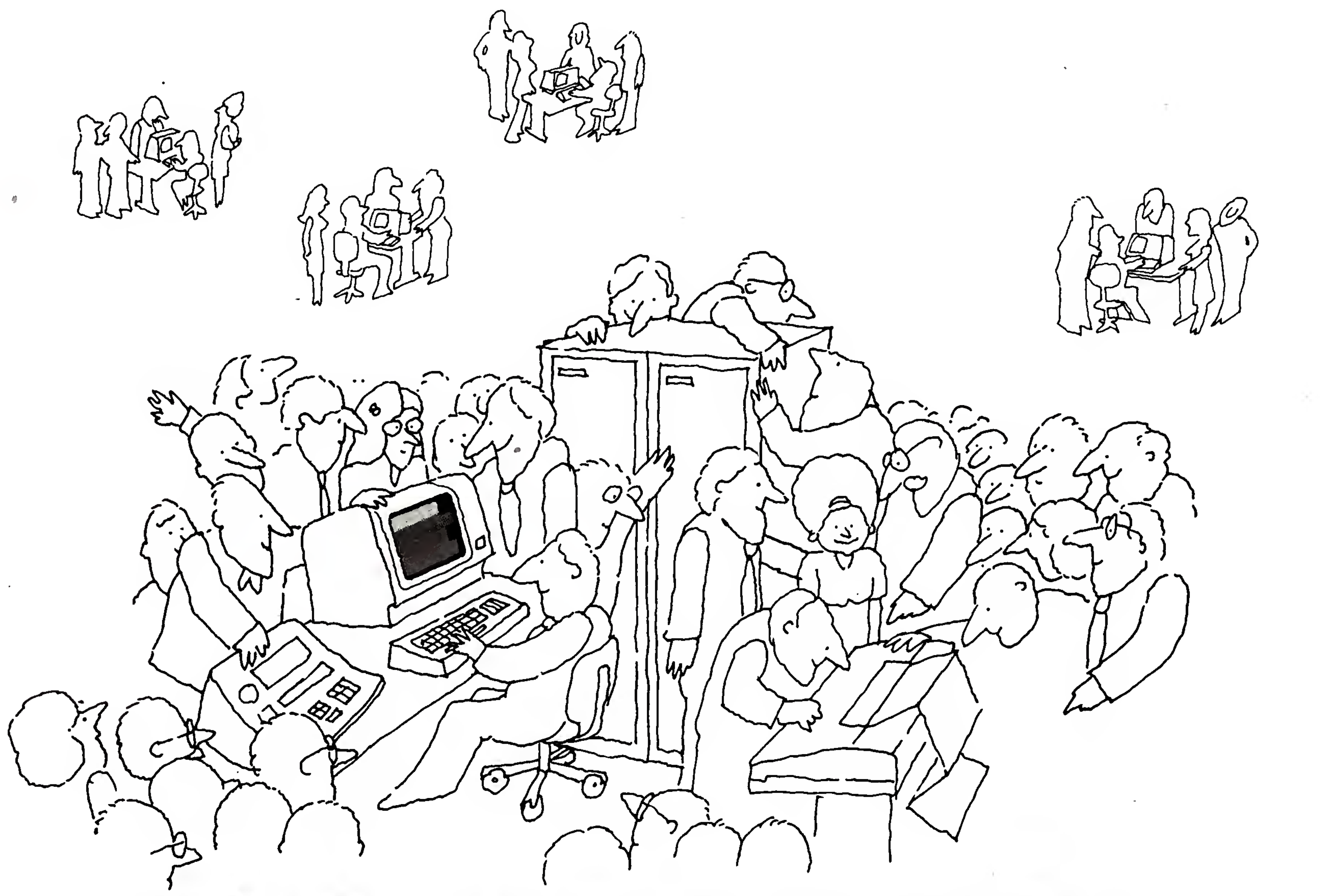
25-Cent Call

"In return for a 25 cent phone call," Seago commented, "the truck stop receives a swift, secure system that checks and records customer credit activity, practically eliminates the chance for human error and can be worked by an employee with just a couple of hours' training."

Since the Micro-Fone also transmits information on the data, location and time of each transaction, the carrier can use the list to keep track of the expense per driver, truck and trip.

In addition, the Express system can provide carriers with such important benefits as the following:

- Instant money transfer, relieving truckers of the risk in carrying large sums of cash.
- Constantly updated tax reporting and payment for the lower 48 states.
- Tracking and production of the variety of state permits truckers will need before they cross state lines, thus preventing the costs due to delays and penalties.



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EDITORIAL

Before It's Too Late

"Poor planning and fragmented management."

That criticism has been made of government DP programs frequently over the years, particularly by Rep. Jack Brooks (D-Texas), chairman of the House Government Operations Committee and the doyen of federal DP oversight.

The charge takes on new significance, however, when it is leveled at vital defense computer systems, as was the case recently in a Brooks committee report on the North American Aeorspace Defense Command systems [CW, March 22].

Norad computers, the committee said, are obsolete, error-prone and poorly managed. A program to modernize them is years behind schedule and hundreds of millions of dollars over budget. The committee pronounced it a "critical" situation requiring immediate attention if the U.S. is to maintain an adequate attack warning system.

Over the last two years, the Pentagon has tried to assuage the committee's fears, arguing the problems that caused false alerts in the past have been corrected.

We are happy to report the committee is not the least bit reassured by these Defense Department protestations. For if you read carefully recent department testimony on Norad, you find that what has actually been corrected are not the system's management problems, but only some of the more boneheaded operational procedures.

For example, Norad built a $16 million, off-line test facility so the main system will not have to be used for program development — a former practice that in November 1979 led to a false alert. The committee rightly pronounced itself "appalled that Air Force procedures could allow test data indicating a mass missile attack to be fed undetected into the Norad computer system, with the consequence of placing the entire system in a position of high alert and almost activating our nuclear retaliatory forces."

While we are pleased the unfortunate testing procedure has been changed, it is distressing that the particular problem evidently was symptomatic of far more serious management failures throughout Norad and numerous other Defense Department computer programs.

Chairman Brooks spends a lot of time taking to task military and civilian agency top brass for failing to properly utilize their powerful, billion-dollar DP systems. When the feisty Texas Democrat pounds the podium the agency officials sit up straight and listen. We hope they are listening now at the Pentagon. Otherwise, future glitches in the Norad system may not be merely alarming; they may be catastrophic.

DATA PAST

Five Years Ago
April 11, 1977

WHITE PLAINS, N.Y. — IBM continued its clearance sale with an average 15% reduction on the purchase prices of its 3330 and 3333 disk systems.

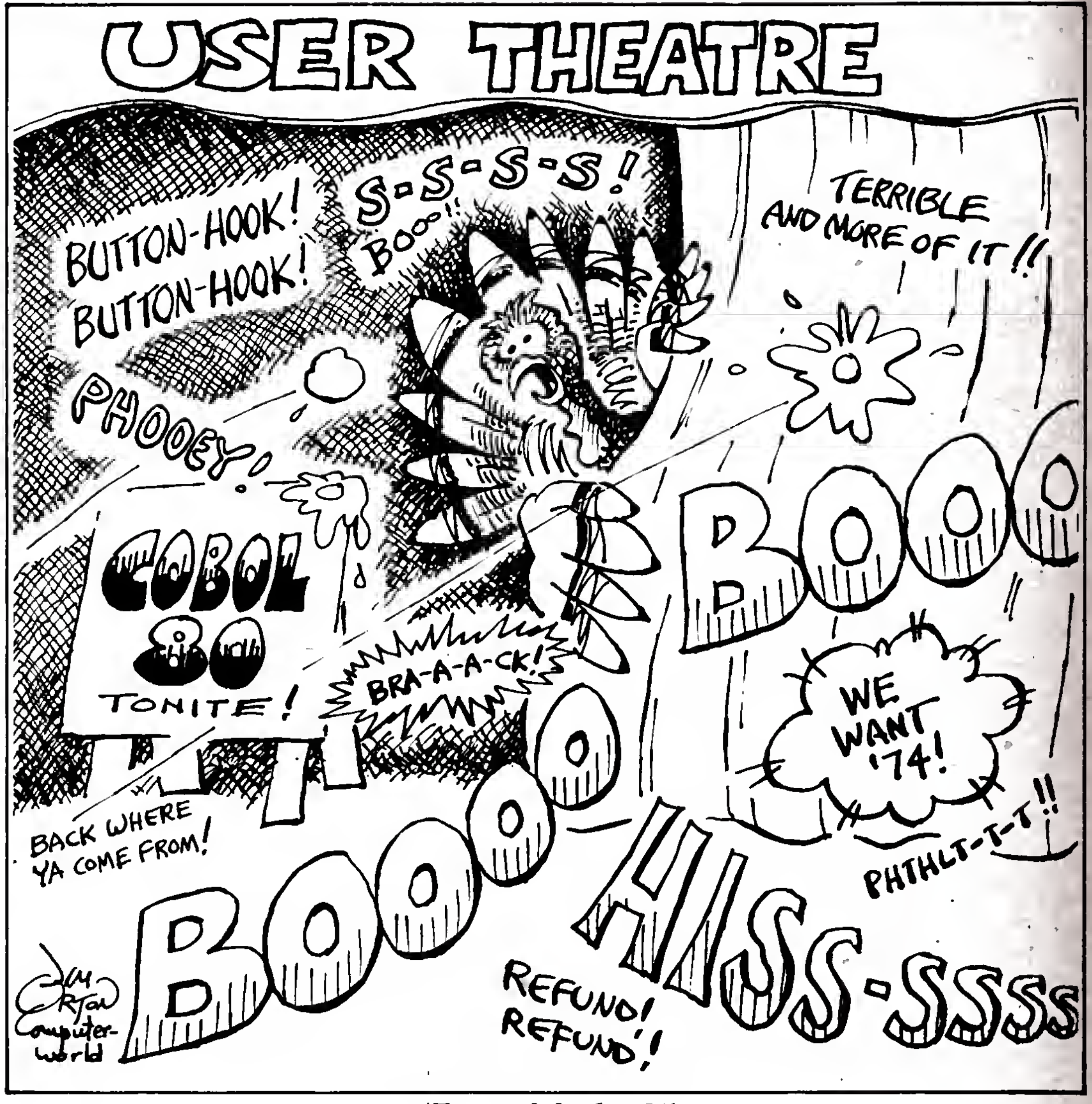
The price cuts in the disk area led industry observers to conclude IBM was trying to move these products out of inventory and off rent in order to prepare for the introduction of a significantly improved disk technology.

In the announcement, the price of the 3330-01 disk system was reduced from $47,610 to $40,470, the 3330-02 from $28,440 to $24,170 and the 3330-11 from $67,860 to $57,610. All were 15% reductions.

Ten Years Ago
March 29, 1972

SAN FRANCISCO — Users of extended core memory equipment apparently were assured of continued IBM maintenance on their 360/30 CPUs despite earlier IBM threats to withdraw such maintenance.

IBM guaranteed to provide such maintenance on a "best efforts" basis as part of a "stipulated judgment" between it, Advanced Memory Systems (AMS) and Itel Corp. that resolved the AMS, Itel antitrust suit against IBM. Officially, however, IBM only said "it would discuss its relationships with other memory manufacturers on an individual basis" and that it hoped to develop "a consistent policy" in this area.


USER THEATRE
BUTTON-HOOK! BUTTON-HOOK!
S-S-S-S! BOO!!
TERRIBLE AND MORE OF IT!!
PHOOEY!
COBOL 80 TONITE!
BRA-A-A-CK!
BOOO
WE WANT '74!
BACK WHERE YA COME FROM!
PHTHLT-T-T!!
BOOOOO
HISS-SSSS
REFUND! REFUND!
Jim Ryan Computerworld

'Et tu, Mother?!'

LETTERS

Applications Revolution

After reading "Poll: Applications Programmer Not an Endangered DP Species" [CW, March 15], I felt that a response was in order.

To take the position that business applications programmers are not going to disappear because packages need modification is indeed a short-sighted view. There is, in fact, a revolution in the process of happening that must be taken into account: applications generators.

Applications generators are, in effect, very high-level programming languages targeted at systems analysts and some end users. These generators produce reliable code so that debugging time amounts to proving the specification correct.

Also, just as one does not tweak code generated from a "normal" compiler — for example, Cobol — one would not tweak code produced by applications generators. Then, except for the few things the generators would not be able to do, programmers would be forced out of applications programming and into applications generator programming, thus greatly increasing their effective productivity.

This force, along with the coming of artificial intelligence, will tend to concentrate programmers and analysts in software houses that would supply applications generators — and in those firms large enough to support such a venture.

Although programmers in general won't be removed in the foreseeable future, business applications programmers will indeed be an endangered species. As a final note, these people will need some amount of retraining to cope with this shift. (Hint: Cobol is not the answer.)

Randy Lee
Suby, Von Haden & Associates, S.C..
Madison, Wis.

Overlooking the Facts

In "IBMer Sees Disks Cheap, Upkeep Costly in '90" [CW, March 1], the writer states that IBM's Luke Short, a senior IBM marketing support representative, reportedly said that from 1970 to 1980 disk maintenance prices have increased significantly and by 1990, they will cost four times more to maintain than they did just two years ago.

According to the article, Short based his prediction on the admitted fact that hourly rate charges for IBM customer engineers has increased 4½ times in the 1970-1980 period.

However, this hourly rate increase has not had Short's purported effect on disk prices in the period of 1970-1980. For example, the commonly used IBM 3330-1 monthly maintenance charge was $170/mo in 1970 and in 1979 it was still $170. This statement disproves Short's conclusion that disk systems maintenance prices increased significantly in the 1970-1980 period.

Upon further analysis, it is obvious that maintenance prices per megabyte of disk have not increased in 10 years but rather have decreased significantly.

For example, the new IBM 3380B4 monthly maintenance is $240 or a per megabyte monthly cost of approximately 10 cents, whereas the aforementioned 3330-1 cost was 85 cents. Clearly, the maintenance costs have dropped significantly in the past 12 years and the trend, therefore, is for them to get even lower.

In summary, we are at a loss to explain why a senior IBM representative can overlook some obvious facts that would totally shatter his conclusions and predictions.

Thomas W. Burke
President
World Leasing Corp.
Ridgewood, N.J.

SOFTLINE/Werner L. Frank‡

Problems That Plague Software Development

My colleague, Paul Connolly, is an executive of one of the larger operating units of Informatics, Inc. His job is to guide 500 professional programmers in accomplishing programming tasks for all clients. Therefore, improving the process of software construction is his keen concern.

When confronted by the recurrent criticism that software is always "too little and too late," Connolly likes to drive home the point that the causes of many problems that plague software development are not properly understood. When the process of software construction is compared to an analogous process, building construction, for example, the solution to some of these problems becomes clear.

In the building industry, after all, aren't most buildings finished as prescribed, on schedule and within their budgets? Isn't it true that these buildings stand up under their expected use for long periods of time? Who or what is responsible for this kind of success?

The building industry has evolved over thousands of years and has developed an infrastructure that blends the talents and know-how of a number of disciplines — all directed and controlled by the "general contractor." This management function orchestrates the building process, tieing together the efforts of specification, design, development and turnover to the "end user."

The team coordinated by the general contractor consists of the architect who designs under the aegis of well-developed, proven principles; the draftsman who translates abstract designs into engineering drawings; engineers who review for structural strength; and the various specialty subcontractors who bring expertise in carpentry, plumbing, electricity and so on, each exercising the particular methods and tools appropriate to his craft.

What makes the process especially effective is the industry's commitment to standards and precast parts so that full advantage can be taken of the produced modules.

The catalyst that brings it all together and assures a high degree of success is third-party review — the inspections that check for adherence to standards and rules. The process of incremental licensing, as a requisite to proceed, gives the building construction business the necessary discipline and incentives to do a journeyman's job.

Built by Specialists

Software should also be built by specialists. It should be disciplined by rigorous quality assurance. As Connolly put it, "tough jobs deserve the professional touch."

The ideal procedure for developing new software would then go as follows:

1. Customer (end user) states his needs through functional specifications and external design. These documents comprise the requirements.

2. The software general contractor is brought on the scene to supervise and execute the software construction process.

3. The end product is turned over to the in-house staff for system phase-in and operation.

Several benefits are now evident:

- Sudden peak load on in-house staff is avoided.
- Key in-house personnel are not tied up in a production process.
- Personnel specialization and required expertise is acquired on an as-needed basis.
- The construction is done by a construction firm bringing to bear all the tools and techniques of the trade.

To sum it all up in an analogy — should a business depart from its normal work and objectives to construct its own building, to perform its own janitorial service, to run its own cafeteria — or are these services that can be better provided by an outside expert? If the answer to this last question is yes, then why shouldn't software also be provided by outsiders?

These concepts of software construction have been embodied in an offering that Connolly terms the Application Development Service (ADS). This service packages the management, staff, tools and techniques and provides turnkey responsibility for fulfilling the software need.

The key to its success, however, is the use of inspections as the driving mechanism. This is the difference that separates ADS from conventional contract programming services.

Powerful Tool

Inspections are a powerful tool for both programmers and managers. Just as in the inspection of a building under construction, the software in development is compared at various stages to the original plans and specifications in order to identify problems as well as to evaluate adherence to standards.

The technical leaders and managers depend upon the inspections for checkpoints in tracking a project. These inspections become review milestones that must be passed successfully before further development can proceed.

Inspection is a methodology developed and popularized through the internal programming construction efforts at IBM.

Important contributions to the computer literature that describe this IBM experience can be found in M.E. Fagan's article, "Design and Code Inspections to Reduce Errors in Program Development," in the *IBM Systems Journal*, No. 3, 1976 and in the IBM report, "Inspections in Application Development, Introduction and Implementation Guidelines" (GC20-2000-0), August 1978). The efforts reported upon here are the further evolutions of the process developed at Informatics, using the technique for applications programming development.

Depending upon the nature of the programming services, inspections may be conducted at several stages: project goals, preliminary design, detailed design, test plan or clean compile. Beginning the inspection in the earlier stages is most advantageous since eliminating problems at that point can lead to enormous savings during later phases.

To begin the inspection, a team is formed. While the individual members will vary from team to team, the roles performed remain the same.

(Continued on Page 32)

HUMAN CONNECTION/Jack Stone‡

Self-Sufficiency Outweighs Performance In One User's Selection of Software

This is Part 7 of a continuing series on new users learning to cope on the job.

There is no doubt about the key issue that DPers address when selecting new software, and that is operating performance.

However, as is the situation with so many aspects of business systems, users have far different perspectives on software selection than DPers, and my experience with Ira Schoen on this matter was a case in point.

As a systems consultant to Ira in his efforts to automate the offices in his directorate — a user organization in the U.S. International Communications Agency (ICA) — one of my major tasks was to recommend software for dual Wang Laboratories, Inc. OIS 140s that were soon to arrive.

The machines were acquired by the ICA Automatic Data Processing (ADP) Group from a master contract won by Wang after competitive bidding several years earlier.

By way of background, ICA, a foreign service organization whose activities are largely unpublicized in the U.S., is surely one of the leaders in the application of computer technology to office automation.

Late in the '70s, the ICA DP group began developing innovative plans to implement computer-based systems at their overseas posts and headquarters locations during the '80s, and the machines destined for Ira's organization were part of those plans.

Happily, I had access to a comprehensive information needs statement for Ira's operation that was prepared by the ICA DPers, and after a few minutes reflection it was obvious that Wang word processing facilities plus a decent generalized data base management system (DBMS) would do his job very nicely.

File reformatting facilities, which allow for restructuring the file without having to reenter data, were mandatory because the users would surely be requesting file changes as they gained experience with the system.

Two Alternatives

There were only two practical alternatives: The first was a powerful but complex system that was custom-developed for the ADP Group to meet a special requirement on the OIS. I was familiar with the system and loved to work with it, in part because it could do so much, and partly because it was a lot of fun to resolve its operating problems.

Although I foresaw the experience in converting the system for Ira to be a heady one, I rather relished the prospect of doing it. The second alternative was a Wang software product called List Processing.

When I checked out the initial List Processing release months earlier, I found it to be only a cut above a toy relative to my idea of a DBMS since it had such deficiencies as: the inability to save sort or report specifications (you could save query specs, but couldn't modify them after retrieval); the need to pass print files back into WP for output processing; a sort speed that was slower than molasses at a Fourth of July brunch in Biloxi; and no file reformat capability. It didn't even have a file name index.

Then, too, I was disturbed that the software was so simple to run that I couldn't see any technical challenge in it for me.

On the other hand, its simplicity does make for a fine demonstration of data systems concepts and I often use List Processing in the classroom for this purpose.

A few days before I was to meet with Ira to discuss software, I happened to spot, sitting on a friend's desk, some preliminary Wang documentation on a new List Processing release.

It told of a major upgrade in management services, including file reformat and index, all of which checked out when I accessed the system a few hours later.

After I explained the software options to Ira, particularly the performance deficiencies of List Processing, he was decisive in his choice:

"Of course we need a system that is reliable and does our job, but its performance is secondary. Our primary concern is that the software be easy for our users to understand and to operate because we cannot afford to be dependent on support from the vendor or anyone else. We must become masters of our own systems destiny and for this reason we will go with List Processing."

Letters to Stone should be addressed to him at Box 270, 1377 K St., N.W., Washington, D.C. 20005.

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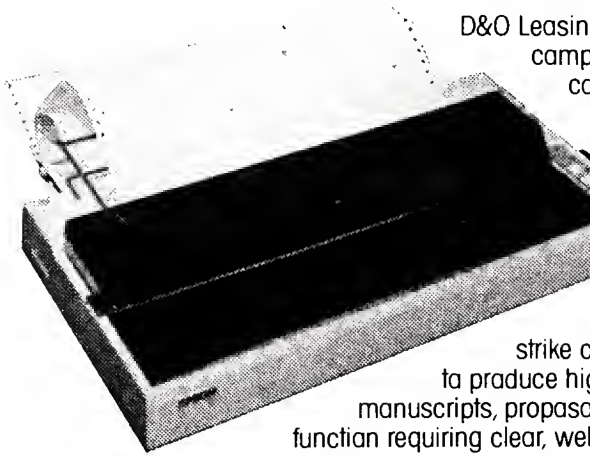

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Development Problems

(Continued from Page 31)

Each team is led by a moderator, who is in charge of the process. A reader, who is not the author of the computer program, paraphrases the materials at the meetings. One or more inspectors are present who will have reviewed the materials. This team meets with the author of the design or code, who has prepared the materials to be inspected according to a list of criteria.

At the first meeting, the materials are distributed, and the general background and philosophy of the documentation is discussed by the author. After the overview, the team members individually review the materials, possibly over several days. They use a formal and often specialized project checklist of possible error types to help locate problems.

After this individual preparation period, one or more inspection sessions are held. While the reader paraphrases the materials, team members point out any problems, inconsistencies, violations of standards or ambiguities.

The moderator carefully limits discussions to the job of identifying problems and records every problem noted. Checklists are also used to scan the materials systematically for any problem areas. Design or redesign is not discussed at these meetings; the problems are simply identified.

The moderator tabulates statistical results from these sessions in order to locate common problems and to help plan future inspections. The moderator gives the author a complete list of all problems. The inspection process always assumes problems will be found.

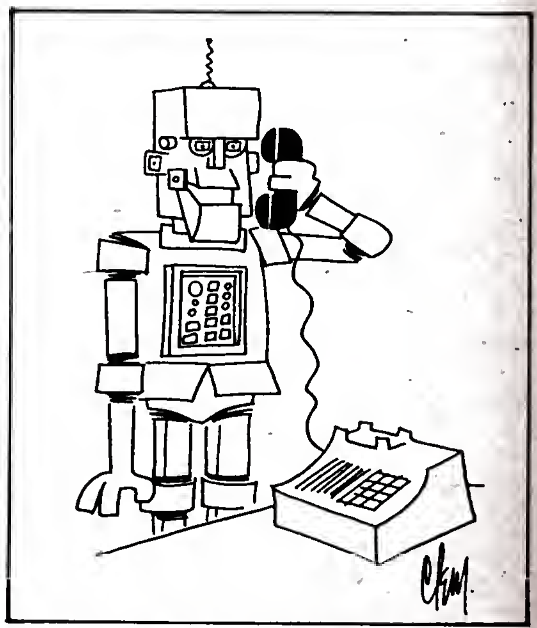
Consequently, as part of the project plan, time is scheduled for rework to fix problems. Depending on the nature of the errors found and the judgment of the moderator, the materials may or may not be reinspected by the inspection team. The moderator has the responsibility to ensure all rework is performed.

The inspection process should not be confused with another popular review method called the walkthrough. The walkthrough places the author at the helm of the discussion. Thus, impartiality is given up and the temptation is present to go down familiar paths. The author may also view the work from a biased point of view and could easily gloss over the difficult and unknown areas.

Inspections help to shift the emphasis toward more thoughtful design rather than hasty code. Successfully employed, inspections have led to programs that require 35% to 65% less debugging and test time. Problems reported after release of the software are substantially reduced by as much as 40%.

These positive benefits are a result of the basic time shift in discovering the errors inherent in any software development project. Experience has shown that as much as 90% of all errors that ultimately reside in a program are detected through the inspection process before unit testing begins.

Frank is executive vice-president of Informatics, Inc. in Woodland Hills, Calif.



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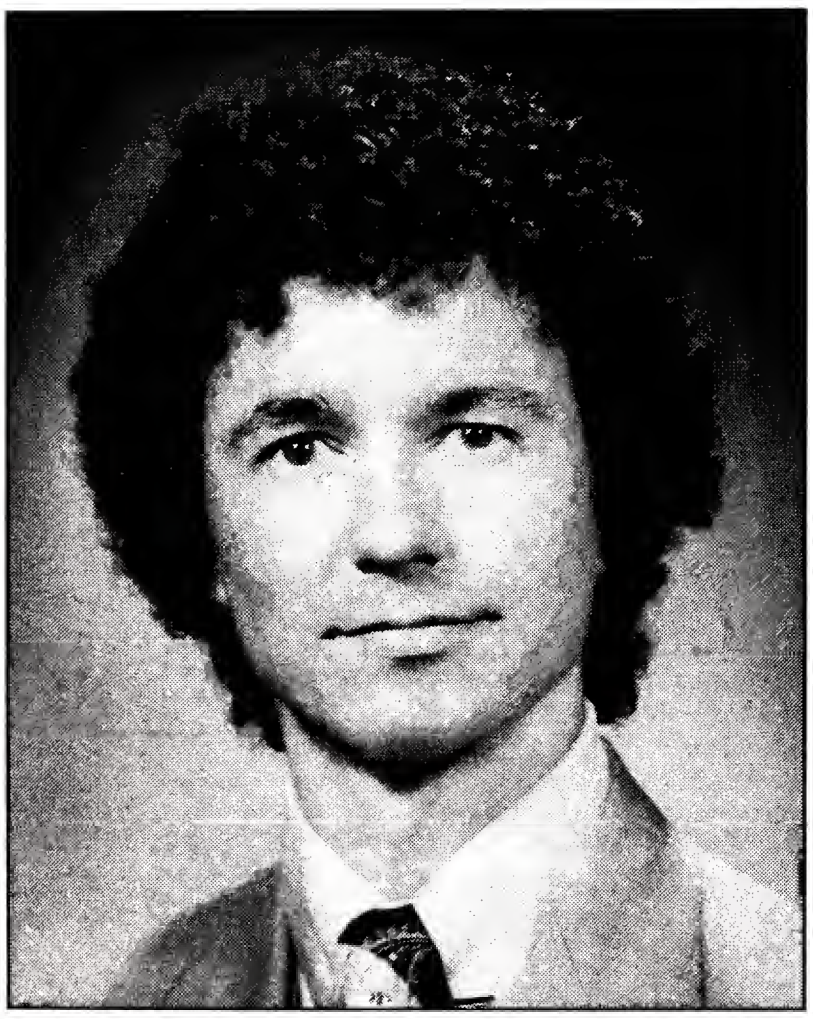

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CW 32982

LETTERS

An Issue for Management

The editorial "Managers and Micros" [CW, March 1] concerning the emergence of microcomputers in large corporations is definitely an issue that DP executives cannot avoid.

The "new-generation" managers may have sufficient technical knowledge to utilize desktop computers. However, the main problem will be the lack of central guidance of corporate goals or anyone to coordinate standardizing all of the functions without experienced DP management.

I believe DP management, for the most part, has worked hard over the past several years toward having all functions utilize the same data. This in itself was quite an accomplishment due to the refusal of many companies to believe information from data processing vs. their own manual sources.

Consequently, many companies ended up with two sets of data and each side questioning the other as to which was correct. Microcomputing could intensify and spread this gap again.

Another item that always seems to place constant pressure on information people is that an application seems to take many more computer resources than originally anticipated.

Microcomputer upgrades from many functions could create more confusion and requests to top management for funds to supplement projects that are only partially completed.

In other words, this will be a repeat of the old days in data processing — but now from several functions rather than just one — without overall coordination and explanation.

Finally, the greatest issue of all is that of trying to cost-justify the computer (and application project) vs. the anticipated payback that DP executives have been required to do for years.

The initial cost of microcomputers is so low that typically no corporate capital expenditure requests beyond local authorization are needed for the hardware. This makes it easy to buy.

But typically, the programming and other people-effort costs are ignored at the beginning of the project. Managers think they can make this effort "in their spare time."

For years, other departments have not been required to do nearly enough of the detailed cost-justifications to obtain the tools they needed to get a job done, much less figure fairly precise paybacks. Microcomputers will create more confusion during the next few years because they will take away functions needed to develop long-term overall computer application needs that relate to all functions.

In summary, a great on-the-job educational period (wonder how long it will be?) for the new-generation managers in actual DP business applications will occur. The net result will be that very little will be accomplished toward solving the long-term corporate systems goals.

But more people will become more knowledgeable about what it really takes to utilize DP properly in a business system.

The result will make the DP executive's job much easier in providing the proper automated systems needs at more levels of business functions. Those who keep their noses to the grindstone during this period of time and stay involved as much as is allowed should emerge as extremely valuable systems personnel to clean up and coordinate overall corporate objectives.

Those who choose to sit back and observe the chaos will be absorbed into the mess and will never really know what happened.

Nick Johnson
Vice-President
Information Systems
Mid-Con Corp.
Indianapolis, Ind.

'Need to Mumble'

Werner L. Frank's "Computerese and Communications Confusion" [CW, Jan. 18] and the controversy it has started is certainly amusing. I happen to agree with Frank, but I feel he will never be convinced of the need to mumble. As a former professional pilot, I could gain instant respect and awe by simply uttering some inane aviation jargon.

Doctors and lawyers use jargon to their advantage; they talk so no one can understand them — therefore commanding a higher fee. Politicians talk gobbledygook most of the time, but then again most of them aren't intelligent enough to "talk good."

Steven R. Tilton
President
Mentor Systems
Cuyahoga Falls, Ohio

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'DRS' Gives Vsam Recovery For On-Line, Batch

ENGLEWOOD, Colo. — Computer installations operating in both on-line and batch environments are given the ability to recover Vsam keyed records or data sets lost due to a system or program malfunction, equipment failure or user error with a product recently released here by Saturn Software, Inc.

The Data Recovery System (DRS) reportedly runs on the IBM 370, 303X, 4300 and equivalents, executing under the OS/VS operating system, VS/1, SVS and MVS.

It is said to work with an on-line monitor such as CICS/VS that journals all adds, updates or deletes against the on-line data sets. It has a batch journaling feature that records all adds updates or deletes on behalf of a batch partition or address space.

DRS licenses for $8,000 and costs $900/year to maintain, according to the vendor at 7351 E. Hinsdale Court, Englewood, Colo. 80112.

'Quex' Available For Univac 1100s

AUSTIN, Texas — The Systems Group of Intel Corp. has announced the availability of a full-screen, menu-driven prompting facility for users of the Sperry Univac 1100 series mainframes.

Formerly available only to users of IBM mainframes, Intel's Query/Update by Example (Quex) supports Univac's Universal Terminal Systems, Uniscope and various other CRTs. It retrieves and updates files from Intel's System/2000 data base management system and allegedly requires only one hour of training.

The records available to a user can be related hierarchically, relationally or linked together in a network. Expanded data editing features make Quex a data entry tool, as well as a data manipulation facility.

The price for the Univac version of Quex is $20,000 for 1100/60 series machines and $25,000 for all other Univac 1100 series. Further details are available from the vendor at 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

Applications Software Seen As Benefit, Not Cure-All

By Steven D. Bell
Special to CW‡

With the recent explosive proliferation of low-cost computers in the small business marketplace, millions of companies can now take advantage of advanced technology in their daily operations. Unfortunately, the availability of experienced programmers has not kept pace with the growth in hardware sales.

Although packaged applications software is helping to fill this void, packages are not a panacea, and the small business user should exercise care when considering the acquisition of such a system.

Packaged software systems usually are low-cost, generalized computer programs designed to perform standard business functions such as payroll, inventory and general ledger. Such a system usually consists of the program object code on appropriate media, printed system documentation and operating instructions and some sort of technical support from the vendor, such as installation, training or software maintenance.

The main advantage of a software package to the small business merchant is its low price tag. Because the vendor can distribute his development costs to many users, packaged software is usually far less expensive initially than a custom-designed system.

However, even using packages, the small business computer user should plan to spend from 50% to 100% of the hardware purchase price for applications software. These percentages will probably go up as equipment prices fall and development costs increase.

Another advantage of packaged software is that it is usually well tested and can greatly reduce user debugging. In addition, installation time is often considerably less than that required to implement a custom-designed system.

The Main Disadvantages

The main disadvantages of software packages hinge on their lack of flexibility. It is extremely rare that a software package will fit all the needs of a business operation. Relatively inexpensive packages can quickly become costly if the user requires system modification. Modifications may be completely impossible with vendor and turnkey packages, forcing the business to adapt itself to the computer system.

The small computer user should make sure the package will run on the available hardware. Some packages have specific requirements in terms of minimum core, on-line storage media and operating systems.

In addition, he should make certain that the package emulates the desired business operation as closely as possible. Ask the vendor for a list of companies using the package and visit an installation having similar operations.

Such a visit should also be used to determine what bugs exist in the package and the degree to which the vendor supplies system support.

Bell is a consultant with Integrated Management Systems, based in Redlands, Calif., which specializes in small business systems and software.

'Flexigraf' Package Offers Graphics On IBM OS, MVS

PHOENIX — Capex Corp. has announced Flexigraf, a full-color business graphics package designed to execute under the IBM OS and MVS operating systems with TSO.

Flexigraf is a management productivity aid that transforms reports into color graphics. Users can create charts, graphs, company logos, organizational charts and graphics designs, the vendor explained.

The visuals created by Flexigraf can be displayed and plotted on Tektronix, Inc., Ramteck Corp., IBM and Hewlett-Packard Co. terminals and plotters, according to Capex.

Flexigraf was designed to be fully integrated with the vendor's Autotab II financial planning package. Users reportedly can perform forecasting and analyses with Autotab and then show the results with Flexigraf, according to a company spokesman.

A permanent license for Flexigraf costs$26,000. When purchased as an option to Autotab II, the package is priced at $18,000, Capex said from 4125 N. 14th St., Phoenix, Ariz. 85014.

Abend-AID, an OS and DOS Operating System Enhancement, transfers the manual, error-prone task of analyzing program abends from the programmer to the computer. Abend-AID tells what happened, where and why it happened in brief English text that eliminates the need for hexadecimal calculations. Abend-AID is language independent, and works for old and new programs in a test or production environment.

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Running on AOS/VS, RT32

Pascal Available on DG Eclipse

WESTBORO, Mass. — Data General Corp. has announced that Pascal is now available on its Eclipse computers running under AOS/VS and AOS/RT32.

AOS/VS Pascal uses the large address space of the Eclipse 32-bit systems and reportedly conforms to the proposed Ansi standard for Pascal, according to the vendor. In addition, DG claimed it features many extensions to the standard that contribute to simplified program development and reliable code.

The initial license for AOS/VS Pascal is $6,000, including installation, Software Subscription Service for one year, Comprehensive Software Support and Software Trouble Report Service, according to the vendor.

Delivery is in 90 days from DG's Information Systems Division, 4400 Computer Drive, Westboro, Mass. 01581.

"Fundmaster" Fits DG Systems, Uses CS Cobal

LOUISVILLE, Ky. — Fund-Master, a software package for fund-raising organizations, running on Data General Corp. systems, is available from Schulstad, Myers & Associates, Inc.

Fund-Master is an on-line interactive fund-raising management package, the vendor said, adding the package uses DG's CS Cobal.

An account file contains all donors and prospects, according to the vendor. Modules include pledge, fund and account file maintenance, cash/receipts processing, statistical reporting, account inquiry, mailing labels, file extractions for target marketing and donor analysis, the vendor said.

Fund-Master can be interfaced with Schulstad, Myers & Associates' general ledger, accounts payable, payroll, word processing and report generator to form a complete accounting system, the vendor said.

The one-time, end-user's license for the package is $15,000 and is available from Schulstad, Myers & Associates, 4010 DuPont Circle, Louisville, Ky. 40207.

Design Aid Out From Auto-Trol

DENVER — Auto-Trol Technology Corp. has announced a Spatial Programming Design System (SPDS) for the firm's AD/380 automated design and drafting equipment. The package reportedly allows architects, space planners and facilities planners to solve space allocation problems by manipulating various graphics solutions on a CRT terminal.

The package costs $15,000, the vendor said from 12500 N. Washington St., Denver, Colo. 80233.

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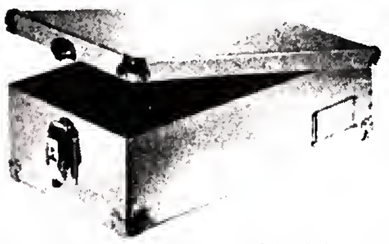

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"POD II" Runs On IBM 4300

ORLANDO, Fla. — A proof-of-deposit (POD) item processing package for banks with IBM 4300 DOS/VSE systems has been introduced by Florida Software Services, Inc.

POD II also serves as an operations management tool that generates analysis reports for reducing and controlling float, even though the Federal Reserve item pricing schedule has created a restricted environment affecting the proof and transit operations of banks, the vendor said.

Designed for banks with $50 million to $500 million in assets, the software ranges in cost from $21,000 to $26,000. Florida Software Services can be reached at P.O. Box 2269, Orlando, Fla. 32802.

For DEC, Unix Systems

Image-Processing Package Bows

SAN JOSE, Calif. — An image-processing package that includes both "single-cycle" and "high-level" subroutines for users of Digital Equipment Corp. and Bell Laboratories, Inc. Unix-based equipment has been announced by Grinnell Systems Corp.

Ipex operates with Grinnell's standard Fortran package, which reportedly gives users full access to all display functions of Grinnell software without the need for machine-language programming.

Ipex Capabilities

Ipex expands this capability and allows complex image-processing tasks, including both point- and spatial-processing functions, according to Grinnell. Ipex point-processing functions include thresholding, histogram equalization and various mathematical mapping tranformations.

The basic Grinnell Fortran Subroutine/Device Driver package sells for $500, and Ipex is available for an additional $500. Further details can be obtained from Grinnell at 2159 Bering Drive, San Jose, Calif. 95131.

Contel Fits DBMS to DEC, Announces 'MPMath'

GREAT NECK, N.Y. — Contel Information Systems, Inc. has announced RTfile Version 3.0, an interactive relational data base management system for Digital Equipment Corp. PDP-11 and LSI-11 processors under the RT-11 operating system.

The firm also announced MPMath, a manipulation program for 16-, 32- or 48-bit fixed-point numbers.

Version 3.0 of RTfile includes several enhancements in addition to multifile processing, which reportedly allows users to define relations involving up to five separate data bases, and a new utility — RTmenu — which is said to enable users to interactively create menus for their own applications and revise all RTfile menus to accommodate site- specific requirements.

RTfile Version 3.0 costs $2,500, the vendor said.

MPMath reportedly operates in RT-11 environments as well as under the RSX-11M, TSX-Plus or Star-eleven operating system. It handles any combination of single-, double- and triple-precision numbers and includes subroutines for performing multiple-precision compare, the vendor said.

The package costs $250. More information is available from Contel Information Systems, RTfile Marketing, 4330 E.-W. Highway, No. 200, Bethesda, Md. 20814.

JSS Package Enhanced For System/34, 38

JEFFERSON CITY, Mo. — Software Systems, Inc. has announced enhancements to its 5280 Job Stream Supervisor (JSS), a memory resident operating system for IBM System/34 or System/38 host machines.

The JSS package has reportedly been enhanced to improve support of the firm's 5251 Model 12 Emulator program product.

The enhancements also include group data set and volume copy, group data set clear and delete and diskette initialization functions to the Dataset Utility program, according to the vendor.

JSS carries a license fee of $560, and enhancements are available for a $10 distribution fee, according to the vendor.

Software Systems can be reached at P.O. Box 1766, Jefferson City, Mo. 65102.

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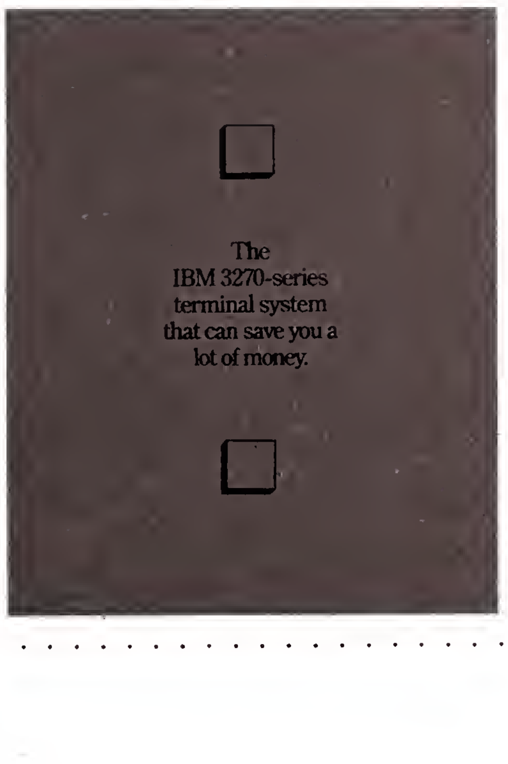

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For Data Accuracy

DBMS-990 Gets Integrity Option

DALLAS — Texas Instruments, Inc. has announced a transaction-level integrity option to its DBMS-990 data base management system software package.

The enhancement is said to increase data accuracy by allowing programmers to define a series of logically related steps as a single transaction and not allowing incomplete transactions to be applied to the data base.

With the option, the DBMS-990 system is said to return the data base automatically to its previous state if all the updates within a transaction cannot be performed successfully.

Closed Viewing

No other user can view any of the data involved in a transaction until the transaction has been completed, the vendor said.

DBMS-990, running under TI's DX10 and Dnos operating systems, ranges in price from $2,650 to $3,150, depending on media. The option is free to DBMS-990 users, according to a company spokesman.

TI can be reached at P.O. Box 202146, Dallas, Texas 75220.

On-Line Business Package Unveiled for HP 3000

ITHACA, N.Y. — An on-line, interactive business planning software system for the Hewlett-Packard Co. HP 3000 computer has been developed by Vocom.

Prophet/3000 provides a model that includes a budget section, labor section and a revenue section. Underlying these three sections is a flexible organizational structure in which parts of an organization, profit centers, departments or locations can be created, as well as their hierarchical relationship to one another.

The system allows for one year of planning and provides for monthly breakdowns of activity. It is written in Cobol II and utilizes HP Image/3000 and VPlus/3000 packages. The introductory price is $495 from Vocom, The DeWitt Building, Box 847, Ithaca, N.Y. 14850.

'Indexx' Lists Data Table

DALLAS — Data Index, Inc. has announced Indexx, a package that provides a table of contents or key-word index from existing or new programs.

The package is available for systems running IBM DOS, DOS/VS or DOS/VSE operating systems. The package is written in Ansi standard Cobol and is added to existing report programs to control full or single-entry indexing, the vendor said.

The package costs $250, the vendor said from 4390 Alpha Road, Dallas, Texas 75234.

IBM Introduces Course For Managers

PORT CHESTER, N.Y. — A self-study course introduced here by IBM is said to help project managers, systems analysts and others plan and conduct application requirement studies with users.

"Managing the Requirements Definition Phase" is part of a series called "Managing the Application Development Process."

The series' Independent Study Program is a prerequisite for the course, which takes six to nine hours, a company spokesman said.

Course Subjects

The course covers planning and organizing the project, orienting the project participants, establishing the interview and data gathering plan, conducting the user group orientation meeting and collecting the requirements definition data.

Also included will be consolidating and analyzing the data, drafting the system requirements report, holding the final walk-through and updating the report and delivering the system requirements report.

The workbook/text, including examples and exercises, costs $195 from IBM, 900 King St., Port Chester, N.Y. 10573.

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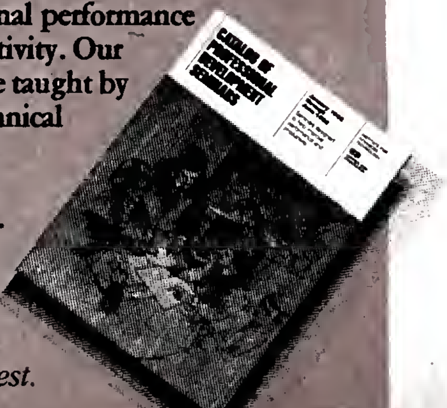

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Quasar Adds Generator For HP 3000

OTTAWA, Ont. — Quasar Systems Ltd. is offering an application generator called QTP for use on Hewlett-Packard Co.'s HP 3000.

QTP has been added to Quasar's Quiz and Quick application generators for the HP 3000. It is aimed at owners who are developing new applications or are in the process of moving applications, according to a company spokesman. QTP is said to eliminate programming for ad hoc and periodic volume processing in applications such as transaction posting, bulk input validation, daily production updates, monthly rollovers and selective file copying.

QTP is priced at $4,000, Quiz at $6,500 and Quick at $8,500. The total package cost is $18,000 and is available from Quasar, 10th Floor, 275 Slater St., Ottawa, Canada K1P 5H9.

Finance Tool Fits System/32, 34, 38

CARTHAGE, Mo. — An inventory reporting/financial package has been released by CMC Software, Inc. for the IBM System/32, 34 and 38.

The Public Warehouse Inventory and Financial System features order entry and invoicing, billing, track pending-order status, customer reports, credit checks, accounts payable, general ledger and multicompany and multifacility integration.

The total public warehouse package, written in RPG-II and RPG-II Workstation Code, is priced at $18,500 from the vendor at P.O. Box 718, Carthage, Mo. 64836.

Source Comparison Package Offered for HP 3000

CHICAGO — Quality Systems, Inc. has announced RES-Q, a source comparison program for Hewlett-Packard Co. HP 3000 processors. The package is capable of generating audit trails through programming changes and development. RES-Q will also generate a new source file with a change ID string, the vendor said.

The package runs under either HP's MPE 3 or MPE 4 operating systems and costs $2,500. The package is also available for IBM DOS, OS or Sperry Univac 1100 environments, the vendor said.

The package costs $2,500, the vendor said from Suite 2510, 875 N. Michican Ave., Chicago, Ill. 60611.

Two Graphics Packages Tailored to Fit HP 3000s

BOULDER, Colo. — Precision Visuals, Inc. has announced that its DI-3000 and Grafmaker graphics packages have been tailored to run on the Hewlett-Packard Co. HP 3000 computers.

Written in 1966 Ansi Fortran, DI-3000 offers a full range of interactive graphics capabilities, including color, three dimensionality and a graphics data structure, the vendor said. Grafmaker is a package of user-callable subroutines for high-level data presentation, including line graphs, bar graphs and pie charts, the vendor said.

DI-3000 is available for a perpetual license fee of $8,000; Grafmaker starts at $4,000. More information is available from Precision Visuals, 250 Arapahoe, Boulder, Colo. 80302.

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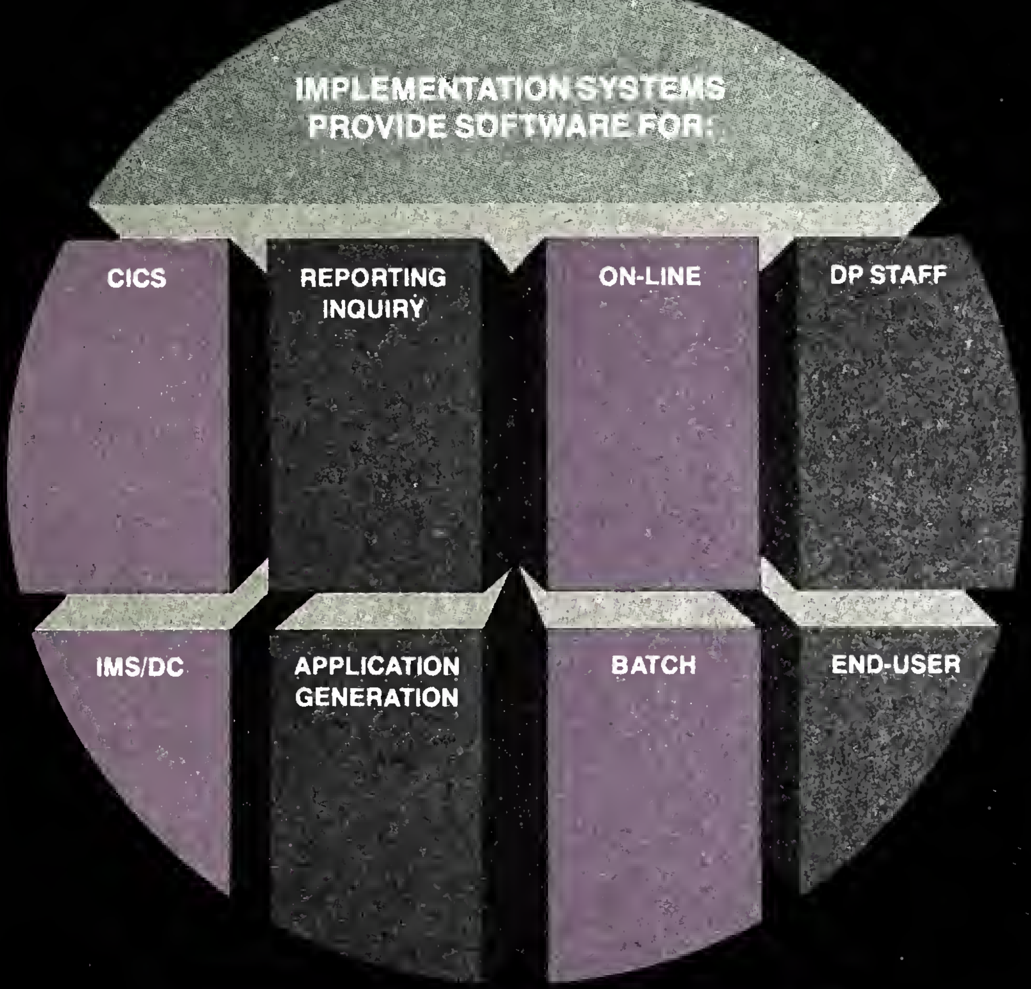

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Security, Training Package Available for System/38

SAN DIEGO — Integrated Systems Management, Inc. (ISM) has announced the availability of the ISM Security and Training System (Isat/38) for the IBM System/38.

It consists of software designed to control and monitor program access and minimize user training time and effort, according to a company spokesman.

Among the on-line, real-time features are user access control, systems documentation and maintenance, standardized message-display function and documentation for systems overview, program overview, expanded error messages and specified field, according to the company spokesman.

Isat/38 is available for $1,750 from Integrated Systems Management, located at Suite 344, 2515 Camino Del Rio St., San Diego, Calif. 92108.

'Remdoc' Prices Cut for System/34

SAN FRANCISCO — REM Associates has announced a price cut on Release 2 of Remdoc, a documentation software package for IBM's System/34.

The package runs on RPG-II systems and provides 23 integrated reports combining up to 30 different libraries, according to a company spokesman.

The package now costs $1,250, according to the vendor.

REM Associates is located at 207 Virginia Ave., San Francisco, Calif. 94110.

Wang VS Series Users Get Financial Modeling Package

RICHMOND, Calif. — A financial modeling package for users of Wang Laboratories, Inc.'s VS 50, 80 and 100 computer systems has been unveiled here by MDS Soft Pro System, Inc.

The Fimod/Cobol spread-sheet analysis program can reportedly handle financial planning, forecasting, budgeting, profit and cash planning and investment-return analysis. It features a 24-char. by 80-char. screen, on-line calculations and recalculations, formula operator commands on rows and columns and a hard-copy print option.

Fimod/Cobol carries an introductory price of $850, according to MDS Soft Pro System, 4121 MacDonald Ave., Richmond, Calif. 94805.

Conference Package Made Available

SAN BRUNO, Calif. — Infomedia Corp. has announced a commercial version of its "Notepad" computer conferencing package.

Currently available for Digital Equipment Corp. DEC System-20 systems only, the software costs $25,000 until April 1, when the price will double.

Infomedia is located at Suite 275, 801 Traeger Ave., San Bruno, Calif. 94066.

IBM's Datamaster Gets Analyzer

NORTH CANTON, Ohio — J.B. Muncer & Associates, Inc. has announced Sorcerer/23, a systems analyzer for IBM's System/23 Datamaster.

The package reportedly features formatted program listings with internal references to statements, dimensions, matrix functions, array elements, regular variables files and subroutines. It also includes formatted procedure listings, file-usage analysis, program/procedure analysis and standardization of reports to fit a 14⅞-in. wide format, the vendor said.

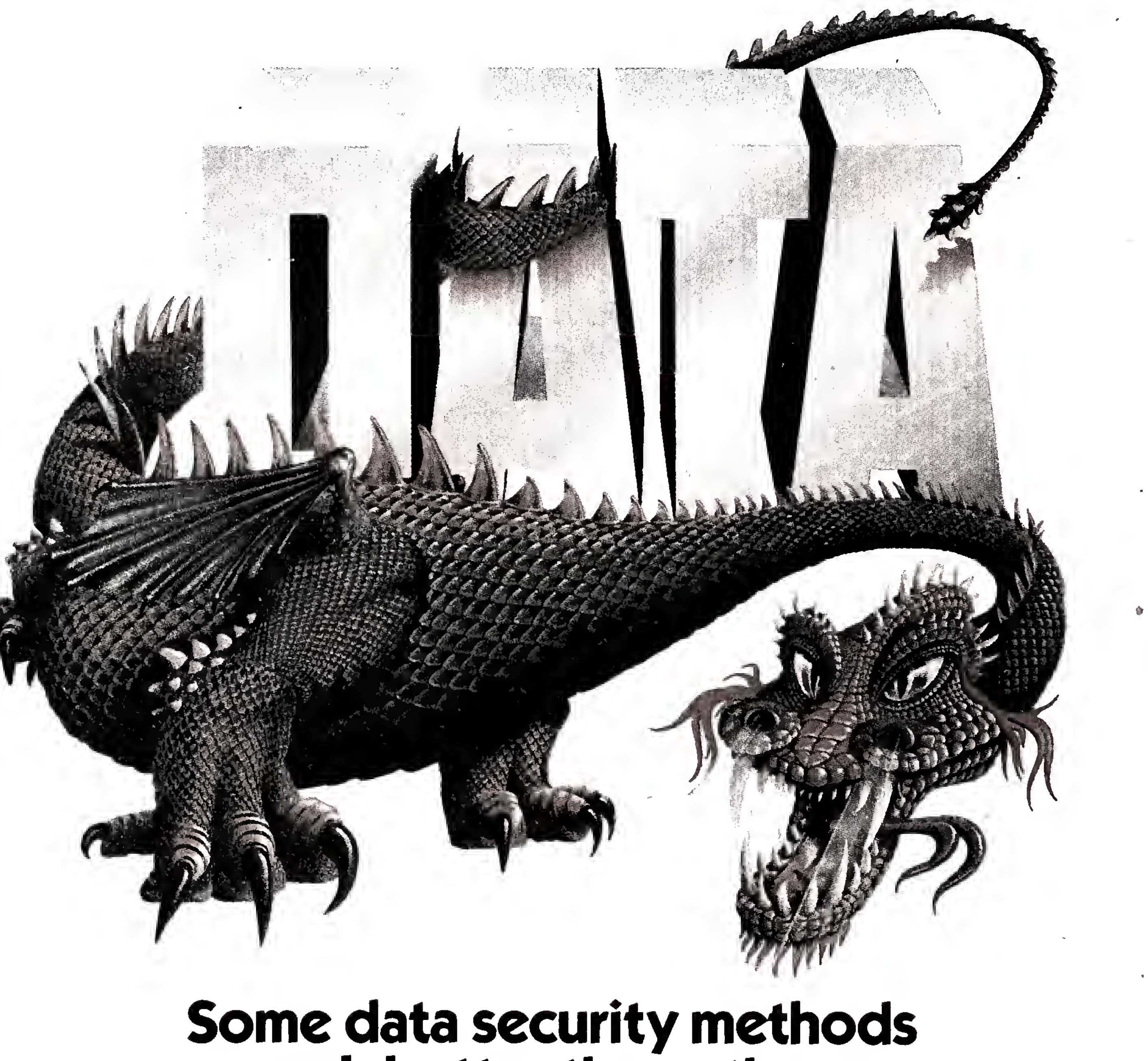
The package is available for a one-time license fee of $350, the vendor said from 4041 Batton N.W., North Canton, Ohio 44720.

Micro Notes

Omniforth, a high-level language based on the Forth Interest Group (FIG)-Forth version of the Forth language and the FIG 79 Standards, is now available to run on Radio Shack's TRS-80 Model III. The package comes on a disk with 150-page user's manual and costs $130 from Interactive Computer Systems, Inc., 6403 Dimarco Road, Tampa, Fla. 33614.

Advanced Digital Products has announced the UCSD **Pascal Advanced Operating System** (AOS 1.0) for its PDQ-3 series computers. For current PDQ-3 users, AOS 1.0 costs $450 including upgrades. To new users, it will cost $800 extra, which includes a $200 Advanced Systems Editor. The firm is located at 7584 Trade St., San Diego, Calif. 92121.

Software Arts, Inc. has announced a **Data Interchange Format** (DIF) as an attempt to establish a standard for exchanging data among personal computer programs. DIF was originally developed for use with the firm's Visicalc program. For $6 you can receive DIF's technical specification, the DIF program list and a reprint from *Byte* magazine: "DIF: A Format for Data Exchange Between Applications Programs," a spokeswoman said from DIF Clearinghouse, P.O. Box 527, Cambridge, Mass. 02139.



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Winds of Change

The Impact of Fourth-Generation Languages On Documentation

By Nancy B. Lerner,
Irv Brownstein
And Wallace W. Smith

Right now, as most organizations are just becoming comfortable with putting system development life cycles into practice and learning how to keep on top of their documentation requirements, we have some news for you.

Fourth-generation languages — those user-friendly, nonprocedural languages — are going to change the traditional systems development life cycle and will also alter documentation standards and requirements.

Bad news? Not at all. The changes will be for the better — a revised life cycle that reflects actual development activities and streamlined documentation with simpler requirements. And with less effort, everyone will get what he wants and needs, including data processing management, users and auditors.

We can only guess at the extent of the changes in requirements and standards that fourth-generation languages will bring about. What is clear, however, is that the winds of change have begun.

Not Just a Buzzword

There are several theories about how the programming languages fall into generations. The widely accepted notion defines the first generation as the machine languages of the early computers. The second generation began in the '50s with the development of assembler languages. The third generation, characterized by high-level languages such as Cobol, Fortran, Algol, RPG and PL/I, emerged in the early '60s. The fourth generation marks the introduction of nonprocedural languages including Focus (from Information Builders, Inc.), Ramis (Mathematica, Inc.), Nomad (National CSS, Inc.), Inquire (Infodata Systems, Inc.) and Mark IV (Informatics, Inc.).

In many cases, fourth-generation languages represent the refinement or elaboration of concepts that emerged in the third generation. Consider the case of

RPG, for example. Initially intended for report generation — to minimize the programming time required for limited or one-time reports — RPG was often inefficiently used for data entry and file updating. Fourth-generation languages have effectively addressed these functions, picking up where languages such as RPG left off.

Fourth-generation languages are not merely "Cobol and RPG souped up," according to Ted Jones, a project leader with Pacific Telephone in San Francisco. "Beyond the new buzzword is a sophisticated development language that allows for great flexibility and use by nontechnical business people. Instead of keeping the MIS function in tight control over all systems activities, fourth-generation languages not only allow users to participate in application development, but they make the users responsible for maintaining the systems as well."

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Kevin McGowan, consulting manager for Information Builders, Inc., the company that markets Focus, characterizes fourth-generation languages as "the first major advance in programming capability since the advent of assembler languages." Their real beauty, he says, lies in the fact that they allow the power of information management to be used where most effective — in the hands of users themselves.

What is so great about fourth-generation languages? While their attributes may vary from vendor to vendor, typically they include:

- Code comprised of nonprocedural verbs with English syntax for ease of use by nontechnicians.
- Dynamic, relational data base accessing.
- Elimination of compiling.
- Elimination of computer operations job control language.
- Host language interface for calls from Cobol and other third-generation languages.
- An interactive file editor.
- Data encryption down to the field level.
- Accessibility to files from external systems through existing keys.

In the Dark Ages . . .

Before we can begin to address changes in documentation standards to meet the needs and capabilities of fourth-generation languages, it helps to understand the origins of current documentation requirements.

With the birth of the project life cycle concept, documentation became a formalized activity and a critical byproduct of the development process.

And where does the life cycle come from?

In the late 1960s, the notion of software engineering was born. "It was characterized, in part, by a belief that the rules of software engineering were identical to those of civil engineering," explains Peter Wegner, professor of computer science at Brown University. "In other words, software should be designed and developed in the same way that any large physical structure is designed and developed."

This concept has been adopted by the Department of Defense in its own projects and has finally "found its way into the mainstream," Wegner notes.

Lt. Col. William Whittaker of the U.S. Air Force explains how the Department of Defense learned its lessons: "Thirty years ago, there were no management techniques to control large-scale development projects. So, if you hired someone to build a bridge or an airplane, it was built exactly as the one before it had been. The problem was, as bridges became bigger and airplanes more complex, you weren't always sure you'd end up with a bridge that stood or an airplane that flew.

"It became clear that this trial-and-error method wasn't good enough, wasn't reliable enough, for the tens of billions of dollars being spent on weapon systems and the like. With the advent of the project life cycle, however, the management processes were developed to truly control the project. And in the end, the bridge did stand and the airplane flew, because their development was guided from the outset by a logical, structured methodology."

When computers were introduced to weapon system development, they were unobtrusive and buried in some detail level of the project. As the software became more complex and more critical, however, delays, errors and poor design had a greater impact on the overall project. "When delays in software development for a missile had the trickle-down impact of $10 billion and several years of valuable time lost, you can believe that the DOD sat up and took notice. It was the equivalent of a project manager saying, 'I'm paying for the software to be developed. I need it and it has to work. We're talking about engineering, not art,' " Whittaker explains.

To manage the development teams

New Demands at HBO

At Home Box Office (HBO), a subsidiary of Time, Inc., the fourth-generation language Focus was instrumental in the early success of the company's information services department.

When the department was formed several years ago, in what has become the highly competitive cable television industry, the need was for a tool that would:

- Involve end users.
- Allow for "quick" system development.
- Provide for systems with potentially frequent and drastic changes.

At the same time, Focus had to coexist with Cobol, which was used in developing various traditional financial applications.

As a result of this union, HBO's conventional systems development methodology has become strained. Its phases and documentation deliverables do not reflect or take into account the characteristics of Focus as a fourth-generation language.

HBO's experience demonstrates that a systems life cycle and its documentation requirements must be revised to accommodate the use of fourth-generation languages in shops using third-generation languages. The revised methodology must address the unique considerations of fourth-generation languages, the same way it must address issues such as software package acquisition, small projects and maintenance.

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that sometimes numbered more than 2,000 people, the life cycle was brought in. The idea caught on in large companies in the U.S., and with it came the standards and procedures to guide and control the system development process.

> *'Documentation just might improve in the popularity polls as the influence of fourth-generation languages begins to be felt.'*

Same Standards

It is fascinating that in the data processing world, where obsolescence is a daily occurrence, documentation standards have remained basically unchanged. In 1969, Max Gray and Keith London published *Documentation Standards.* The authors define six types of documentation:

- *Analytical.* Reports that precede design or programming efforts, including user request, feasibility study, project plan and functional specifications.
- *System.* All information needed to define the proposed system to a level that can be programmed, tested and implemented, including the system specifications.
- *Program.* The records of detailed logic and coding of the constituent program's of a system, including the program specifications.
- *Operations.* Procedures required for operations personnel to run the system including data control and security, data preparation, program running and output distribution.
- *User Aids.* Material necessary for users to participate in running the system.
- *Management Aids.* Documentation that provides management with nontechnical descriptions of the system for evaluation and operational purposes.

While some of the names have changed, these same kinds of documentation exist today.

Pressures Abound

The criticality of documentation is compounded by a host of pressures including auditing, personnel turnover and the demands of system users and operators. "With the growing sophistication of data processing as a stable corporate function," explains Anthony Gioffre, vice-president of DP auditing at Bankers Trust in New York, "it is imperative that DP provide the same safeguards as its functional counterparts. Proper authorization to perform transactions and segregation of duties are the fundamentals of audit controls, procedures and security. And documentation is one of the means to institute these controls, procedures and security.

"Nobody disputes the importance of documentation. Unfortunately, it doesn't change the fact that in general, there is vast room for improvement in documentation in most data processing shops. It is invariably left to the end of any development project and then, if it is done at all, is put together half-heartedly by a programmer or analyst who has no idea how good documentation is created," Gioffre concludes.

With programmers changing jobs as frequently as every one to two years, it becomes impossible to live without documentation. The days of the "lifers" are gone — those loyal employees who spend their entire careers in one company. At the same time, nearly every DP manager has made the mistake of watching the one person who knows a system inside and out walk off the job, leaving no morsel of documentation behind.

The ability of users and operators to interface with the system is determined, in large part, by the documentation provided. And users' documentation needs grow as more activity and control shift their way. Users must have the tools to understand and interact with systems to perform effectively.

"It is the proverbial vicious cycle," says Joe Rigo, president of Sysdoc in New York. "Documentation is used if it is well-written, organized and comprehensive. On the other hand,

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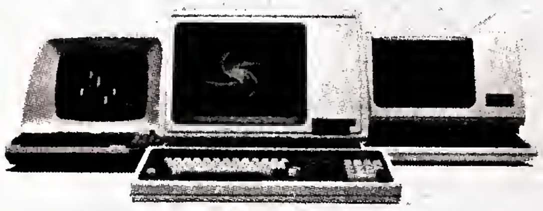

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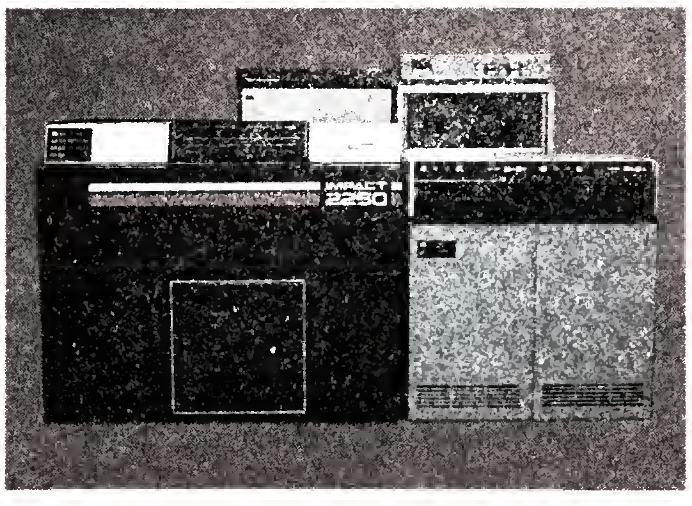

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if you give it to a disgruntled analyst or programmer to prepare, chances are it won't be any of those things."

Gioffre and Rigo agree that one of the key means of getting documentation developed — and done well — is through a dedicated internal function to provide technical writing support or through people brought in from the outside.

Documentation just might improve in the popularity polls as the influence of fourth-generation languages begins to be felt. Judy Metzner, president of Embassy Education, a Guttenberg, N.J., consulting firm specializing in fourth-generation languages, believes that fourth-generation language documentation requires less time to prepare and demands less detail.

"When a system is designed in Cobol," Metzner explains, "about one-third of the development time is spent in front-end documentation, including feasibility study and functional specifications. With fourth-generation languages, the same documentation requirements all exist, but with much less detail needed.

"I find that the documentation for a fourth-generation language-developed system is reduced to 20% of overall project time. This happens primarily because programs are easier to document and system specifications are less critical. With the prototyping capabilities, you can use experimentation to finalize design, rather than relying on time-consuming system specifications that you are locked into. Once the user is happy with the prototype, you can go back and develop the specs for historical purposes," Metzner says.

Susan Rosenzweig, information center coordinator at ESL, Inc., a Sunnyvale, Calif.-based subsidiary of TRW, believes that fourth-generation languages require greater emphasis on user documentation: "Fourth-generation languages really put a great responsibility on user documentation. In order to make users truly independent in their ability to develop applications under a fourth-generation language, the documentation must be excellent."

Both a users' guide that is tutorial in nature and a comprehensive technical reference manual are necessary to instruct someone in not only how to operate the system, but how to harness its resources to help him in his work, according to Rosenzweig.

Current Standards Work

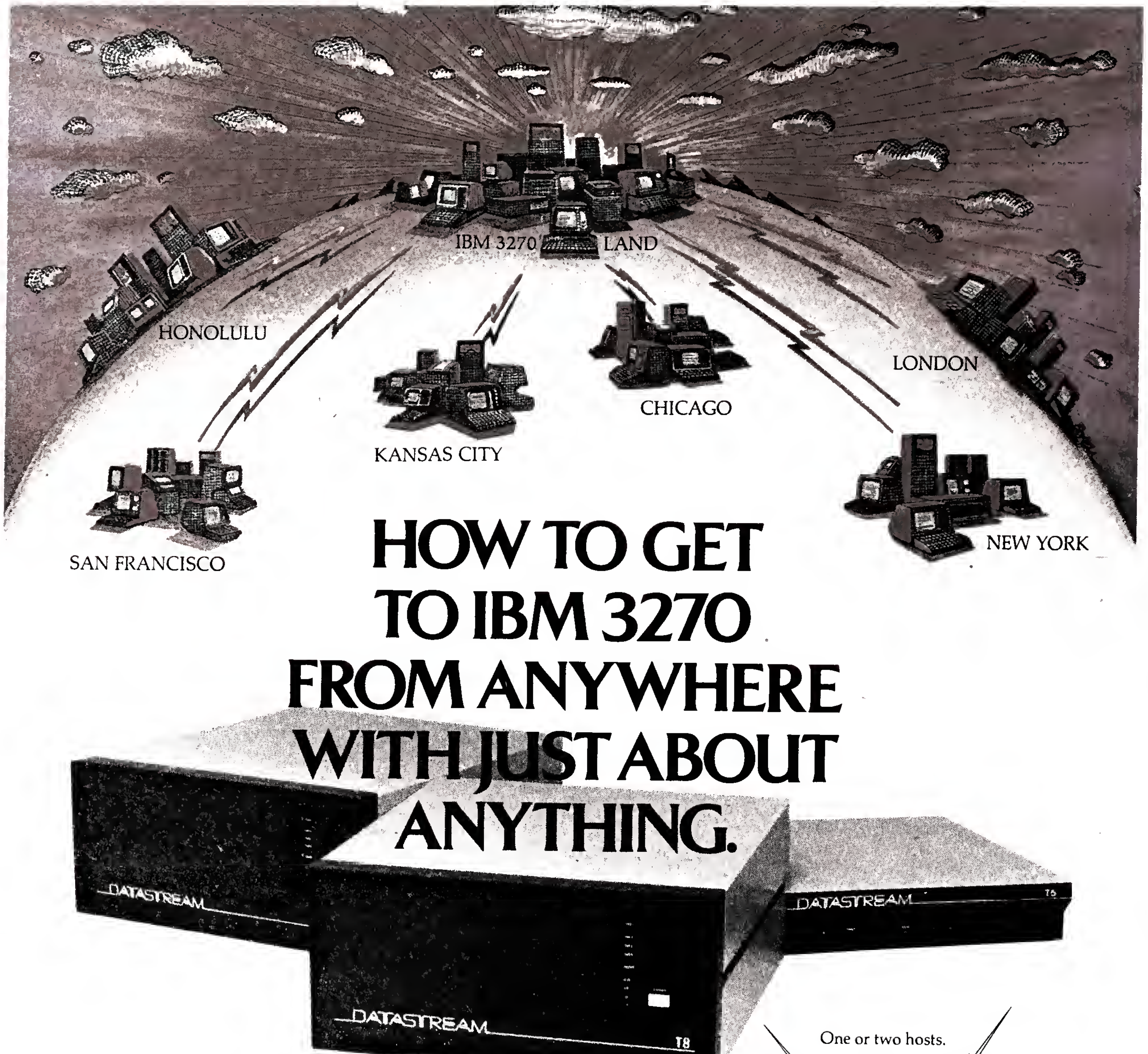
It is obvious that documentation strain could very well ease with fourth-generation languages. A need for less detailed documentation and more user participation may both be big factors. The challenge is to design these new standards now — as fourth-generation languages begin to proliferate — to make them responsive to system designers, users, operators and auditors.

Fuse, the Focus user group, is also squarely facing the challenges of fourth-generation languages. Through a study of past and current documentation practices, it is beginning to shape a new set of documentation standards. This topic will be a central issue when Fuse meets on April 5.

"We are fighting the notion that documentation is the consummate albatross for data processing," observes Lenore Shapp, assistant vice-president of Merrill Lynch, Pierce, Fenner & Smith, Inc. in New York. "With a new set of documentation standards in place, we can then modify the traditional project life cycle to reflect accurately the development process for fourth-generation languages."

What will these new standards look like? Well, as we begin to explore the life cycle and its related documentation products, our early forecasts are:

- Functional specifications will evolve into the *statement of business requirements*. This statement, jointly developed by users and DP, will still document the conceptual system from a business point of view as a contract between user and DP. Once the system becomes operational, however, portions of the statement will be incorporated into the user manual. Items such as the definition of input and output requirements will be consumed by the development effort.
- Reduced emphasis on detail de-



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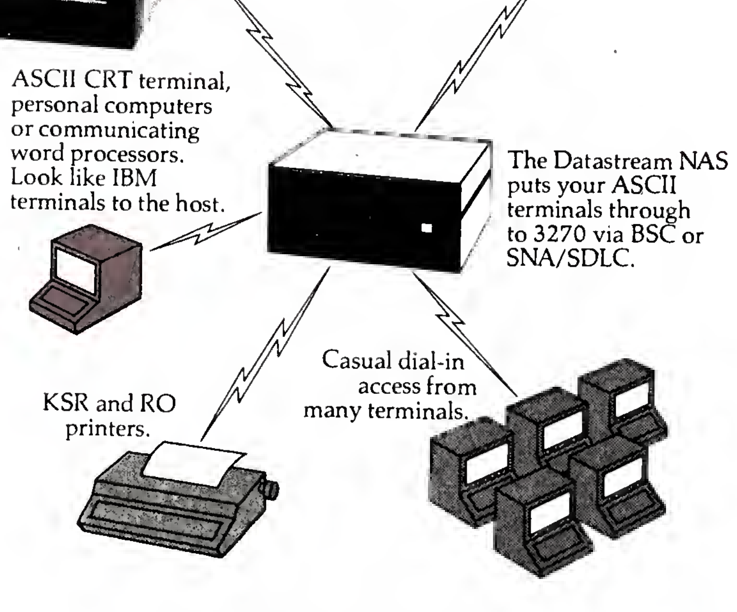
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sign definition will tend to eliminate program specifications, reduce system specifications as such and incorporate many elements as *general system considerations* in user documentation.

- The systems test and parallel processing plan will become the *systems demonstration plan*. Again, the user will play a major role in developing the plan, including generating test data and so forth.
- The responsibility for conducting the systems demonstration will shift away from complete control by DP toward the user, once DP has conducted a preliminary demonstration.
- Operational documentation as we currently know it will disappear. In its place, data entry procedures and the like will move into the user manual. At the same time, a *service contract* will be drawn up between the user and the data center to define roles and responsibilities for operational systems.
- The *user manual* will become the most critical segment of the total documentation package. It will be the user's responsibility to maintain, after the manual is developed — preferably by the user, but probably as a joint effort between user and DP. As mentioned above, it will contain portions of the statement of business requirements, general systems considerations and data entry procedures. In addition, the user manual will include a description of data files, scheduling, input and output, as well as procedures for ad hoc reporting.

Unanswered Questions

As fourth-generation languages begin to proliferate, they raise some provocative issues:

- How do you integrate fourth-generation language capability into an organization driven by Cobol technology?
- How do you raise the level of sophistication of fourth-generation language software to support financial (and other critical, sensitive) applications by addressing security and control concerns while allowing systems to be easily accessible to users?
- Do you accept the personnel productivity that seems to be higher with use of fourth-generation languages at the cost of substantially higher computer usage?

Organizations across the country are beginning to grapple with these challenges. The information center concept is being used for prototyping and quick reports; and symposia, such as one conducted recently by the Indiana University MBA Advisory Council, are being held to discuss these growing pains and help ease them.

"We are just beginning to make use of the powers of fourth-generation languages," notes Merrill Lynch's Shapp. "And as our knowledge and sophistication increase, we will have some interesting conflicts to resolve. Getting the documentation standards revised and the systems development life cycle modified now will put us a jump ahead."

About the Authors

Nancy B. Lerner is vice-president of The Productivity Group, Inc. (TPG), which specializes in quality assurance-related consulting services and software products.

Lerner has 10 years' experience in a variety of business activities, including a special emphasis on documentation and standards and procedures development. She was previously a consultant on the National EDP Strategy staff of Coopers & Lybrand's Management Consulting Services Group.

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Smith received his BBA in accounting from Baruch College.

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Managing the Maverick

A Three-Point Approach for DP Professionals

By Gary Slaughter

DP professionals have been described as loners, "a breed apart." How do you manage and motivate them? Part 1 of this three-part series showed the results of a recent study by University of Colorado professors J. Daniel Couger and Robert Zawacki, which proves statistically that DP professionals have the lowest "social need strength" (SNS) and the highest "growth need strength" (GNS) of 600 job categories surveyed. The author proposes a three-point management solution: Part 1 covered the problem of communication; this week, Part 2 tackles motivation; next week, Part 3 will discuss effective DP management skills.

We now know that DP professionals have the highest GNS of 600 professions examined. Their jobs must afford them an unusually great opportunity to grow or they will not be happy in their work.

We also know, as reflected by their "motivation potential scores," that they view their professions as providing a relatively high potential for meeting their growth needs. If their current employer does not offer them a good opportunity to grow, DP professionals will seek new employment where their growth needs will be met. This is reflected in the high turnover rates plaguing most DP organizations today.

The traditional view of management's role in the motivation process is faulty. In a sense, management does not have a role in motivat-

Part 2

ing DP people, unless it is to get out of the way and allow employees to act on their motivation. Nevertheless, in the name of improved management, many DP organizations seem to spend more time finding ways to thwart, spoil and block motivation than letting it be. Most of these organizations struggle under a discouraging set of archaic policies and procedures that systematically stymie the growth of their most highly motivated people.

A DP management approach must meet two important challenges with respect to motivation. First, managers must learn how DP professionals are motivated and what must be done to ensure that this motivation manifests itself in productivity and profitability for their company, as well as professional and personal growth for the individual.

Second, DP managers must learn how to recognize institutionalized barriers to motivation and growth and how to implement a program to replace barriers with a new set of policies and procedures that will encourage the DP professional's growth (better known as a DP "human resource management" program).

Lessons of Maslow

In the early 1940s, Abraham Maslow formulated a motivation model that defined unsatisfied needs as the source of human motivation. He divided human needs into five "need systems" ranging from immature, or lower order, needs to mature, or higher order, needs.

Maslow theorized that only after a person's lower order needs are met will he be motivated by the higher order needs. Furthermore, and most important in the study of motivation with respect to work, once the lower order needs are met, only higher order needs provide motivation.

Following are brief definitions of the five need systems that make up Maslow's needs hierarchy (from lower order to higher order):

1. *Basic Need.* A person is fundamentally motivated to make sure that he has sufficient food, water and shelter.
2. *Safety Need.* Once he is warm, a person wants to establish an environment that will ensure his long-term safety and steady supply of resources to allow him to live.
3. *Belonging Need.* After he is warm and safe, a person becomes interested in social interaction with other people. In the work setting, co-workers become important to him.
4. *Ego-Status Need.* A person wants to be special. The kind of work he does becomes important to him.
5. *Self-Actualization Need.* A person feels the need to come close to realizing his potential at work and in life as a whole.

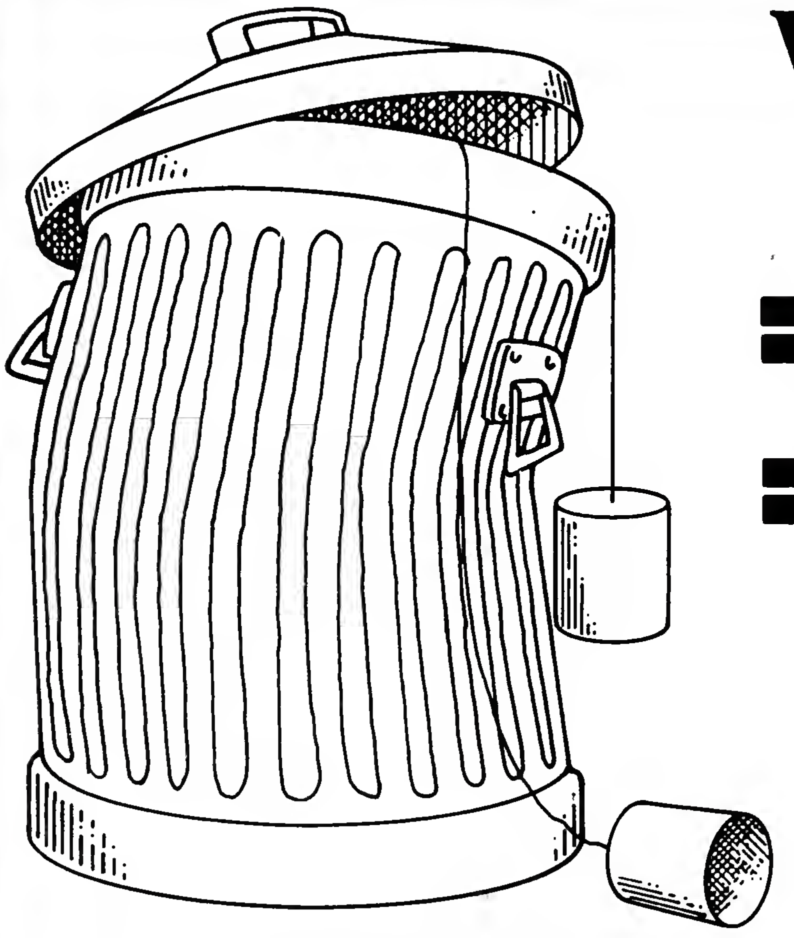
Maslow also theorized that in times of stress or conflict, people tend to revert to motivation by lower order needs. For example, employees often cite low salary as their primary reason for leaving their jobs. What they may not realize is that, because their higher order (growth) needs were not met, they reverted to motivation by lower order needs. In essence, their attitude is, "If you are not going to provide the work environment to allow my growth needs to manifest themselves, then at least I'm going to insist on being paid well." When the pay increase does not meet their expectations, they resign.

The implications of this phenomenon for DP managers are many. The traditional reaction is an attempt to solve the apparent problem (the symptom) instead of the real problem (the lack of higher order need satisfaction).

For example, when the DP organization loses a top-notch employee, apparently because of low salary, most DP managers run to the compensation specialist in the personnel office, demanding that salary scales be increased. While having adequate salaries to meet the lower order needs of your DP staff is important, an increase in salaries by itself will not cultivate motivation by higher order needs. As a result, an increase in salary levels will do nothing to lessen turnover in the long run.

Herzberg's Elaboration

In the 1950s, Frederick Herzberg carried Maslow's model one step further by looking more closely at spe-



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cific factors that motivate people to work. His basic premise was that companies still had not recognized the roots of motivation and were continuously building barriers to it, while spending vast sums of money and effort to satisfy lower order needs. The effect: little or no improvement in productivity.

The results of Herzberg's studies in 1959 showed that the following factors (ranked from most to least important) provided the real answer to why people work:

1. Achievement.
2. Recognition.
3. Work itself.
4. Responsibility.
5. Advancement.
6. Salary.
7. Growth possibilities.
8. Subordinate relations.
9. Status.
10. Relations with superiors.

Herzberg called the first five factors in this list "motivators" or "satisfiers." He characterized them as relating to the job itself or to job content. The second five factors were called "hygiene" factors or "dissatisfiers." These factors relate to the work environment, not the job.

Herzberg established that the opposite of satisfaction in the work environment is not dissatisfaction, but no satisfaction. And, the opposite of dissatisfaction is not satisfaction, but no dissatisfaction.

Accordingly, if people are to be truly motivated to work, their lower order needs (hygiene or dissatisfiers) must be addressed first, then their higher order needs (motivators or satisfiers) must be met.

It does little good to increase the level of effort to meet the lower level needs without providing for the higher order needs. Herzberg stressed that changing the nature of the job itself through job enrichment is the only way to meet employees' higher level needs.

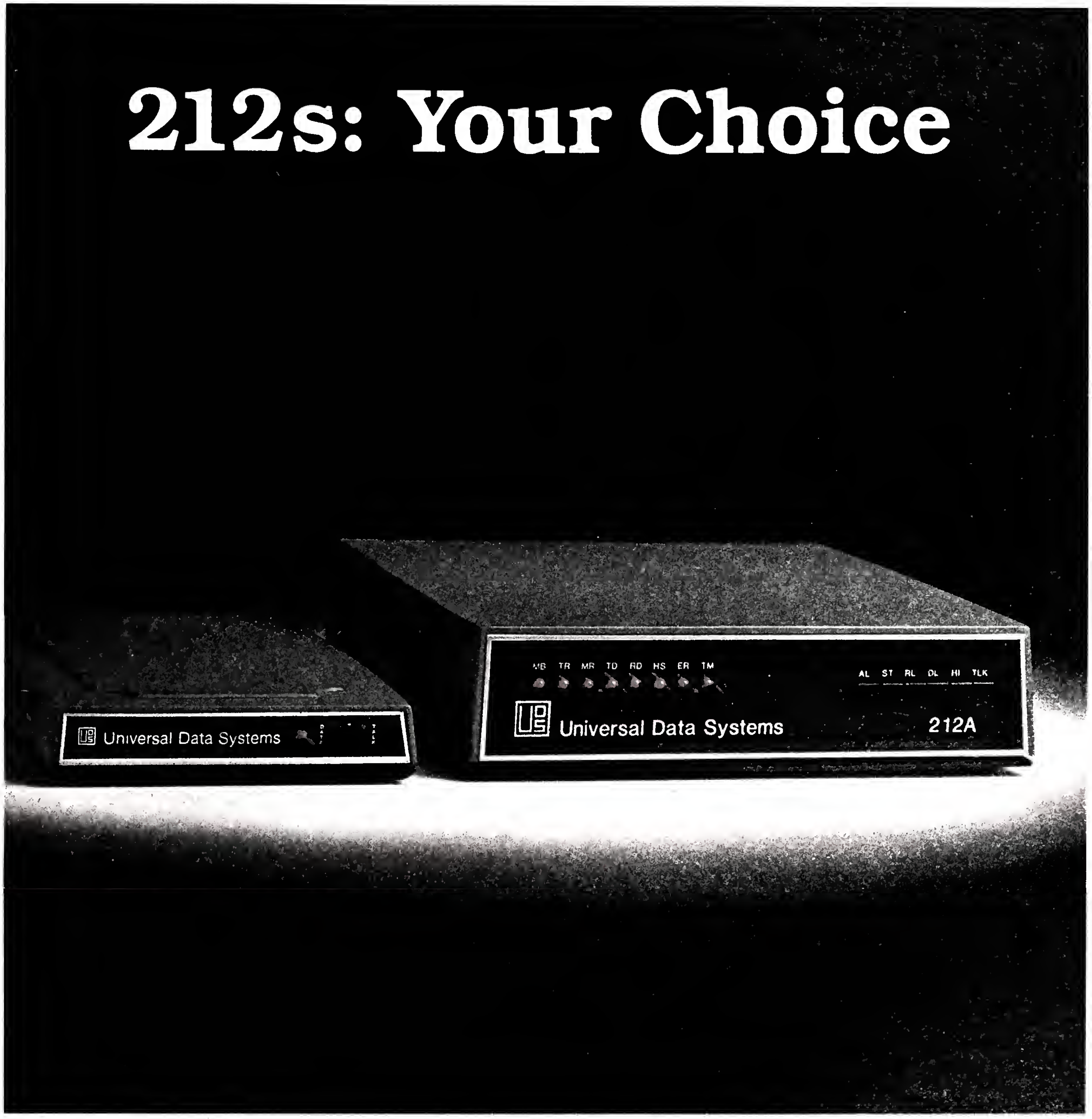
In the DP work environment, there are numerous opportunities to enrich jobs (a process sometimes called "vertical job loading") in both systems development and operations. DP managers should be taught to recognize such opportunities and to avoid confusing job enrichment with job enlargement (or "horizontal job loading").

In 1977, Jacs Fitz-enz applied the Herzberg work motivation model to the DP environment. The Fitz-enz study produced the following ranking of factors (from most to least important):

1. Achievement.
2. Growth possibility.
3. Work itself.
4. Recognition.
5. Advancement.
6. Technical supervision.
7. Responsibility.
8. Peer relations.
9. Relations with subordinates.
10. Salary.

The differences between the results of this study and the original Herzberg work can be attributed to differences between DP professionals and other workers and to changes reflecting the 18-year gap between the studies.

For example, growth possibility rose from seventh to second in the ranking. This difference is consistent with



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the Couger and Zawacki study that showed the high GNS of DP professionals. Responsibility dropped from fourth to seventh place, probably indicating a cultural change in how people view work, rather than any great uniqueness in the DP professional.

Salary dropped from sixth place to 10th. Most DP professionals today are not strongly motivated by salary. Their salary needs are well taken care of, thanks to a shortage of good DP people and to the growing demand for DP systems. It is also interesting to note that relations with peers and with subordinates ranked eighth and ninth. This result also corroborates the Couger and Zawacki finding of a lack of SNS in DP professionals.

Having identified the primary motivators for today's DP professionals, how can we ensure that we are not erecting barriers to motivation in our DP organizations?

Human Resource Strategies

A sound DP human resource management program should include the following strategies:

1. *Teach DP management how DP motivation works.* Ensure that each member of the DP management team knows that DP professionals are highly motivated. All that a manager can do is provide the environment to let that motivation work. Teach DP managers that it is nonproductive to provide further lower level need satisfaction while failing to provide higher level need satisfaction. Teach managers to recognize the steps they can take within their own sphere of responsibility and what steps they can recommend to top management.

2. *Implement a DP job enrichment program.* Show DP managers that more responsibility, achievement, recognition and growth can result if they take the following steps:

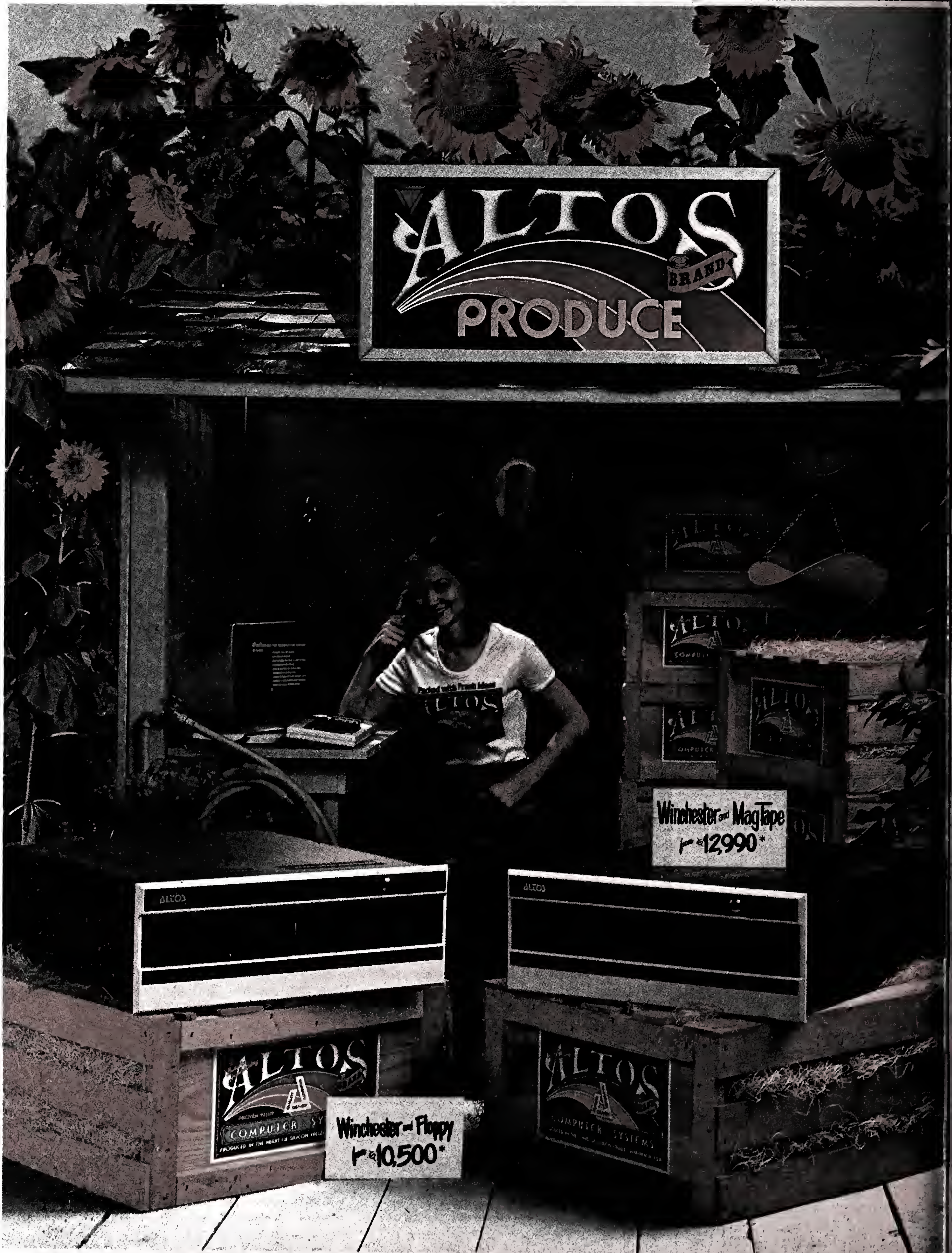
- Remove controls.
- Increase individual accountability.
- Give people complete rather than partial jobs.
- Grant additional job freedom.
- Make reports available to workers, not just supervisors.
- Introduce more difficult tasks.
- Assign specialized tasks to make experts.

Avoid job enlargement (horizontal job loading) when job enrichment (vertical job loading) is intended.

3. *Commit to performance as the sole criterion for advancement.* Nothing stifles motivation more than the use of criteria other than job performance for pay increases or promotion.

An organization's policy on advancement sends a strong signal to its highly motivated employees. It is in the best interest of a DP organization to ensure that this signal indicates that sustained superior performance is the only way to get ahead.

4. *Implement an effective performance appraisal and counseling program.* Recognition and the linking of performance to advancement are the rewards of an effective performance appraisal system. Counseling tells the employee that he counts and that the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organization cares about his growth. Feedback is not a forte of DP management. Formal and informal performance appraisal and counseling are invaluable methods for establishing better job communication and feedback.

Officially, your organization probably has such a program. However, it must be actively used and should give feedback to top management on how employees regard their jobs, the company's management and personnel practices. It must identify superior and unsatisfactory employees and trigger programs tailored to the different needs of each.

5. *Establish an equitable salary policy.* Nearly every organization works hard on this. Salary scales must be competitive and flexible, of course, but it is the administration of the salary policy that counts these days. The salary policy must be tied directly to performance appraisal. Salary increases given to average employees as a "bribe" for staying in a job year after year are directly contrary to the concept of advancement based on performance.

While salary is neither a motivator nor a satisfier in Herzberg's terms, an inequitable salary policy that does not fulfill the basic needs of your DP people can be a dissatisfier. With today's ever-changing and upward-spiraling DP people market, keeping in touch with salary trends is extremely important. Use of task analysis as backup to common job descriptions and to make comparisons with other DP organizations can help DP management establish an equitable salary policy.

6. *Promotion from within.* Nothing shatters the morale and motivation of ambitious, capable DP people more quickly than seeing senior-level jobs filled by outsiders. Many organizations claim to promote from within, but they normally begin recruiting from outside. The usual reasons are, "It takes too long to train someone for that job," or "Our best candidates are too valuable in their current jobs."

Modern, aware DP managers will not tolerate that mentality. They recognize that it is better to promote a top performer from a critical spot than to watch that person leave. They also realize that there should be a strong "bench," so that when a key vacancy occurs, a qualified candidate is ready to step up.

7. *Provide a job-related training program.* A strong "bench" requires that key performers at every level be given training in the classroom, through self-study and on the job. The better DP people deserve the best training. They cannot be considered "too valuable" to be released for training.

And, despite the pressure to do so, the DP training budget must not be cut during times of economic stress. Training gives an organization the opportunity to demonstrate its commitment to helping talented employees advance. Training makes them even more productive and builds their loyalty to the organization. It also allows their high need for growth to manifest itself in

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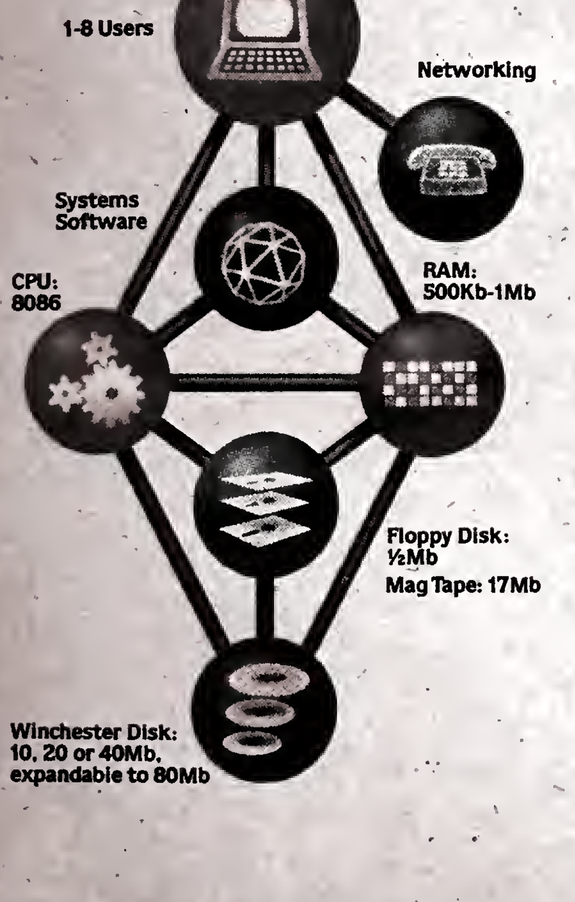

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improved job satisfaction.

Here is another common-sense corollary to the DP training program: If your training is job-related and if you promote and transfer your best people, it will be your best people who need the most training. They need it to prepare for their new jobs.

8. Establish a job recognition program. DP managers should demonstrate real creativity in this important area. Superior performers appreciate public recognition. However, few organizations do anything to provide it.

Properly described jobs are the basis for hiring, salary, job assignments, performance appraisal, training and career advancement. Job titles must be descriptive and should be used for recognition within the company and within the industry.

9. Implement a DP career-development program. A full DP career development program has a number of important components:

- Organization charts showing how all DP activities fit together and describing the functional groups within DP and how they interrelate.
- A task dictionary listing every task in the DP organization.
- Job descriptions showing the tasks within the responsibility of each position (job title) in the DP organization.
- Career-path diagrams showing the desired career progressions and alternatives for all defined DP positions.
- Career-planning guides defining the new tasks required to be performed in moving from one position to another for each possible move on the DP career-path diagram.

10. Implement other DP human resource management practices. Those mentioned above are essential. However, other practices can contribute to or, if ignored, detract from the program's success:

- Job-performance standards are helpful in assigning work, in making performance appraisals more objective and training more effective.
- Use of outside consultants can help, but only if they are used to free valuable DP people for challenging and meaningful tasks.
- Every organization occasionally loses DP people through resignations. A formal program should be instituted to discover the real reasons for this turnover and to rehire superior former employees at the first opportunity.
- Special rules should apply to the job assignments of superior employees. Continuous challenge is essential to ensure that they will stay with the company. Money alone does not provide this assurance.

In Summary

DP professionals are highly motivated to grow in their jobs. However, many organizations have instituted barriers to prevent this growth.

Managers must be taught to understand how DP people are motivated, to recognize and remove barriers to motivation and to replace those barriers with a comprehensive DP human resource management program. Such a strategy will ensure the continued growth and happiness of DP professionals and the productivity and profitability the company deserves.

Next week: The final installment of this three-part series takes a look at effective management skills for DP professionals.

About the Author

Gary Slaughter is president of Gary Slaughter Corp., a consulting firm based in Bethesda, Md. Prior to founding that company, Slaughter was president of Brandon Systems Institute (BSI) for six years, from 1974 to 1979. While BSI president, he introduced a number of services for the DP industry including consortium training and human resource management publications.

Slaughter's DP background includes systems development management, project management and systems analysis positions.

He teaches DP management development courses in communication, motivation, management skills, productivity improvement, problem solving, decision making and conflict resolution. In addition, he wrote the Data Processing Training Manual.

Slaughter spent several years as an officer in the Navy and graduated from the University of Michigan School of Business Administration.‡

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SPECIAL REPORT

Data Communications Terminals: Discussing the Alternatives

Edited by Bruce Hoard and Phil Hirsch

March 29, 1982

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

No Real Asynchronous Leaders

IBM Facing Fight in Synchronous Market

By **Joseph F. Kelly**
Special to CW‡

The alphanumeric display terminal market is generally acknowledged to contain two major segments. The fastest growing and most active segment is currently the asynchronous terminal market.

This field boasts the largest number of competitors, with no one vendor holding a dominant position. Technological advances have triggered major price reductions in this area, putting many terminals with basic editing capabilities in the $500 to $700 range (and less than $400 in volume purchases).

The second major segment of the display market is the IBM 3270 synchronous terminal market. Although growth in this segment has been slower than that enjoyed in the Ascii segment, the sheer number of IBM 360, 370, 30 series and 4300 computer systems installed guarantees a healthy market for both IBM and independent vendors of 3270-compatible equipment.

IBM 3270-type terminals account for approximately one-fourth of all CRT terminals currently installed in the U.S. Of these, about one-half are actually IBM terminals — the rest are compatible models offered by vendors such as Harris Corp., ITT Courier, Inc., Lee Data Corp., Teletype Corp., Telex Corp., Raytheon Data Systems, Inc. and several others.

Deliveries of the IBM 3270 Information Display System began in late 1971. The first generation of devices included the 3271/3272 control units, 3275 stand-alone display station and 3277 cluster display. In 1977 the product line was radically overhauled, resulting in the announcement of a second generation of components, including the 3274 control unit, 3276 control unit/display station and the 3278 cluster display.

Second Generation

The second generation brought with it improved price/performance capabilities and boosted the 3270 family into its present favorable position in the market. The most recent addition to the family came in late 1979 when color was added in the form of the 3279 color display station.

IBM's competitors in the 3270 marketplace are using various strategies in an attempt to capture a share of the market. The two most prevalent of these strategies are to offer 3270-compatible equipment at a lower price than what IBM is charging and to feature faster delivery of their equipment than IBM (delivery time for IBM 3270 components currently is about 11 months). In many cases, these are the only ways a new vendor can hope to penetrate a shop that has traditionally used only IBM equipment.

Other strategies include offering increased price/performance (that is, providing capabilities not found on the IBM unit at the same price) or enhanced ergonomic features (tilt/swivel screen, detachable keyboard).

The 3270-compatible product lines of the independent vendors vary. ITT Courier and Telex, for instance, both offer Information Display System families with components that correspond to each member of the 3270 series. Harris, MDS Trivex, Inc. and Raytheon offer multiple 3270-type product families, each designed around a different market strategy. ITT Courier, Memorex Corp. and Telex have recently expanded their 3270 product line to include a 3279-compatible color display station.

Independent Vendors

Even some traditional Ascii terminal vendors, such as Beehive International, Inc. and Datamedia Corp., have crossed over into the 3270 market with 3270-compatible stand-alone display stations. In addition, some vendors, such as Bunker Ramo Corp., Cado Systems Corp. and Raytheon, offer intelligent terminal systems that provide 3270 emulation. A number of minicomputer and word processor vendors also offer 3270 emulation packages for use on their equipment.

A buyer who is looking to an independent vendor for 3270-compatible equipment should be aware that there are differing degrees of compatibility among the independents.

Most major vendors offer full plug-compatibility — that is, when you plug the equipment in, it will operate in exactly the same way as the IBM unit it is replacing with regard to function and capability. Not all 3270-compatible gear, however, is fully plug-compatible.

Although this equipment will replace the IBM equipment and will operate on the network, not all of the features of the IBM unit will be available. A specific concern in this area is the question of binary synchronous communication (BSC), Systems Network Architecture (SNA) and synchronous data link control (SDLC) protocol compatibility.

Compatibility Problem

The original 3270 components operated under BSC protocol; SNA/SDLC protocol compatibility was implemented following IBM's unveiling of SNA in 1974.

Although most major vendors now offer both, there are some independents who have yet to implement SDLC compatibility. Moreover, even those implementing the basic BSC or SDLC capability might not observe all of the finer points of IBM's own versions.

One trend that has seen increasing popularity in the past few months is that of replacing 3270-type terminals with Ascii terminals on a 3270 network. The replacement of synchronous terminals with asynchronous units is achieved through the use of a protocol converter, which allows the Ascii terminal to support the functional characteristics of the 3270-type unit.

The advantages of this strategy are obvious — Ascii terminals are considerably less expensive than their 3270 counterparts. One terminal vendor, Beehive, has recently introduced an Ascii terminal which, when combined with a protocol converter, is intended to emulate the IBM 3278 display station. There is reason to believe that other Ascii terminal vendors may follow suit.

Kelly is assistant editor — terminals, Datapro Reports and Data Communications, *Datapro Research Corp., Delran, N.J.*

Vendor	System	Controllers	Displays
Beehive	DM 3270	—	3276-2
Carterfone	7276	—	3276
Control Concepts	EM 3275/EM 3276	—	3275/3276
Datagraphix	132-70	3274	3278
Datamedia	3270-S	—	3275/3276
Docutel	TCV 280	3271/3272	3277
Harris	8000	3271/3272	3277
Harris	9200	3274	3278
ITT Courier	270	3271/3272/3274	3275/3276/3277/3278/3279
Lee Data	Series 300	3274	3278
MDS Trivex	Plus 70	3271/3272	3275/3277
MDS Trivex	Plus 80	3274	3278
Memorex	1377	—	3277-2
Memorex	2076/2078/2079	—	3276/3278/3279
Northern Telecom	290	3272/3274	3276/3277
Paradyne	9476/9478	—	3276/3278
Phone 1	P1-3276/2	—	3276-2
Racal-Milgo	4270 Series	3274	3278
Racal-Milgo	4276	—	3275/3276
Raytheon	PTS-100	3271/3274	3277/3278
Raytheon	PTS-2000	3274	3276/3278
Teletype	4540	3271/3272/3274	3275/3276/3277/3278
Teletype	40/4	—	3277
Telex	270	3271/3272	3275/3276/3277/3278/3279

Source: Datapro Research Corp.

Terminals Offering IBM 3270 Compatibility

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Variety Available in Intelligent Terminals

By David H. Freedman
Special to CW‡

Given the trend toward distributed processing, the benefits of having local intelligence at the terminal might be regarded by many users as useful, if not necessary. To meet this need, terminal manufacturers have provided an array of devices that offer intelligence ranging from function keys to high-level programmability (Figure 1).

There is no agreed-upon point at which an editing terminal has enough intelligence to be called an intelligent terminal. At the lower end of the intelligence spectrum are terminals such as Matrox Electronic Systems' CMT-300 and RCA Global-Communications, Inc.'s ZMS-50.

The CMT-300 is an 8-color display with 18 user-programmable keys and 2K bytes of random-access memory (RAM), allowing the downloading and editing of data. The ZMS-50, aimed at telecommunications applications, provides up to 16K bytes of RAM and several communications protocols.

For users requiring a higher degree of programmability, several terminals support high-level languages (Figure 2). Tano Corp.'s Outpost 11, with prices starting as low as $2,000, offers Basic and up to 256K bytes of RAM for applications that include energy management.

The PM-1000 from Piiceon, Inc. supports CP/M and provides an 80- by 66-char. screen for word processing applications. Most such terminals offer extensive peripheral support, including off-line storage, making them almost indistinguishable from microcomputers. But intelligent terminals boast one advantage: They were designed to operate online, while microcomputers generally can offer this feature only through the addition of optional hardware and software.

Dedicated Applications

The incorporation of firmware into intelligent terminals has led to the emergence of several dedicated applications. Most prominent among these applications are word processing and graphics. Workstations such as Xerox Corp.'s Star enable users to extensively manipulate text before sending it off to a host computer, peripherals or a network.

Many such workstations do not support programming and can only be used as word processors, but the current trend is toward multifunction terminals that support versatile operating systems such as CP/M. IBM and Wang Laboratories, Inc., for example, have both moved to CP/M support for their word processing stations.

Graphics terminals probably represent the most advantageous integration of local processing and host communications features. Terminals from manufacturers such as Tektronix, Inc., Laxidata Corp. and Sanders Associates, Inc. provide for the local creation and manipulation of vectors, conics and other forms while leaving the bulk of the data crunching necessary for graphics to the host.

Another terminal application for which intelligence has become popular is that of clustered systems, as in transaction processing and IBM 3270-compatible terminal systems. While the 3270 family is not programmable, systems from manufacturers such as Raytheon Data Systems Co. and Honeywell, Inc. incorporate intelligent controllers and large user memories.

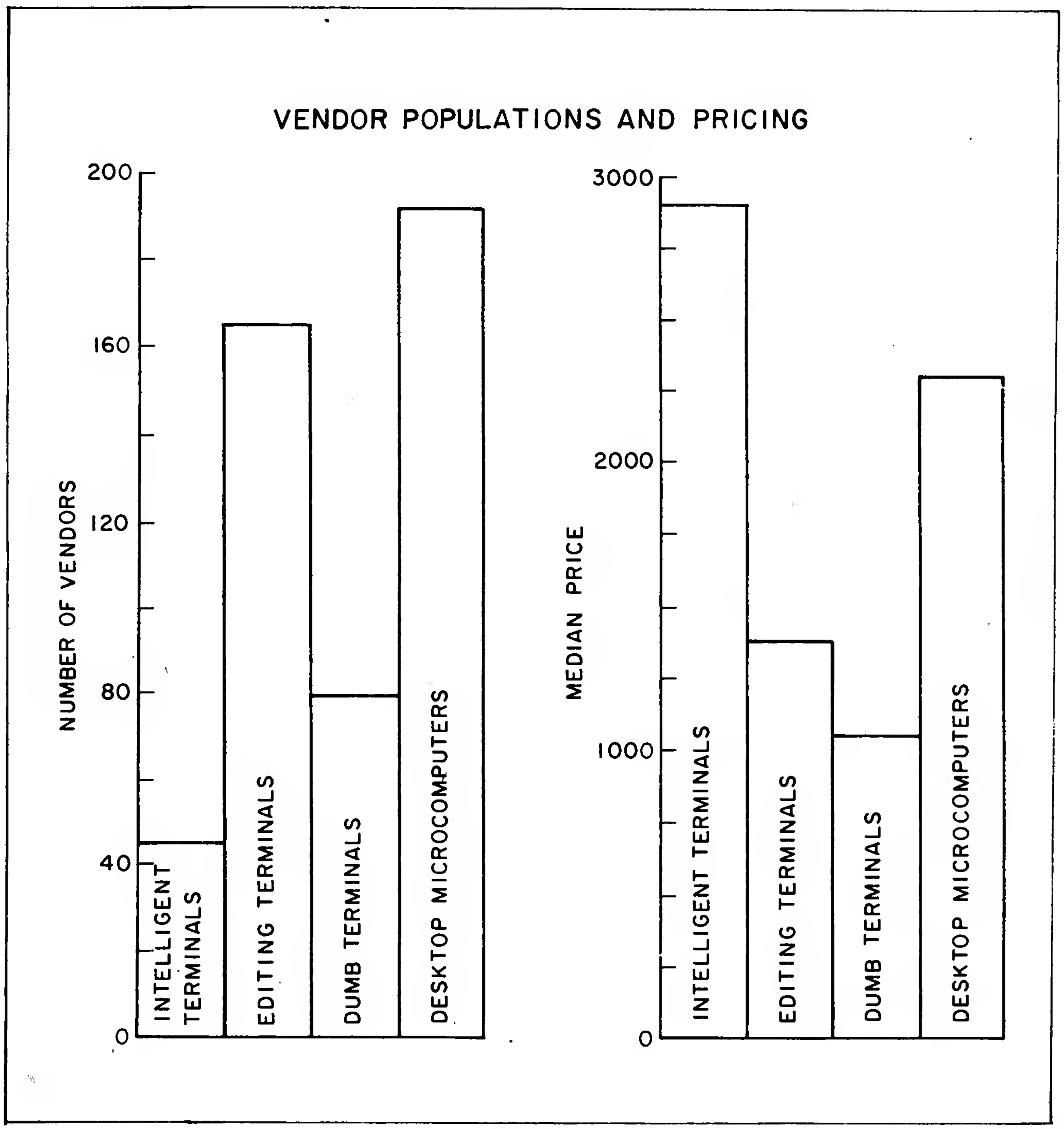
Future Unclear

The future of intelligent terminals is unclear. As microcomputers incorporate communications features, the distinction between them and general-purpose, desktop intelligent terminals might disappear. Workstation-oriented distributed processing systems such as those from Convergent Technologies, Inc. and Apollo Computer, Inc. could eliminate the need for intelligent terminals as they grow in popularity.

Users may even choose to forego the benefits of local processing in the face of the unbeatable price/performance of editing terminals. For as little as $200 over the cost of dumb terminals, many editing terminals provide features such as video attributes, formatting, emulations, a few pages of memory and, of course, local editing. Confronted by such bargains, purchasers will think twice before paying $2,000 or $3,000 extra for programmability and the off-line storage needed to utilize it.

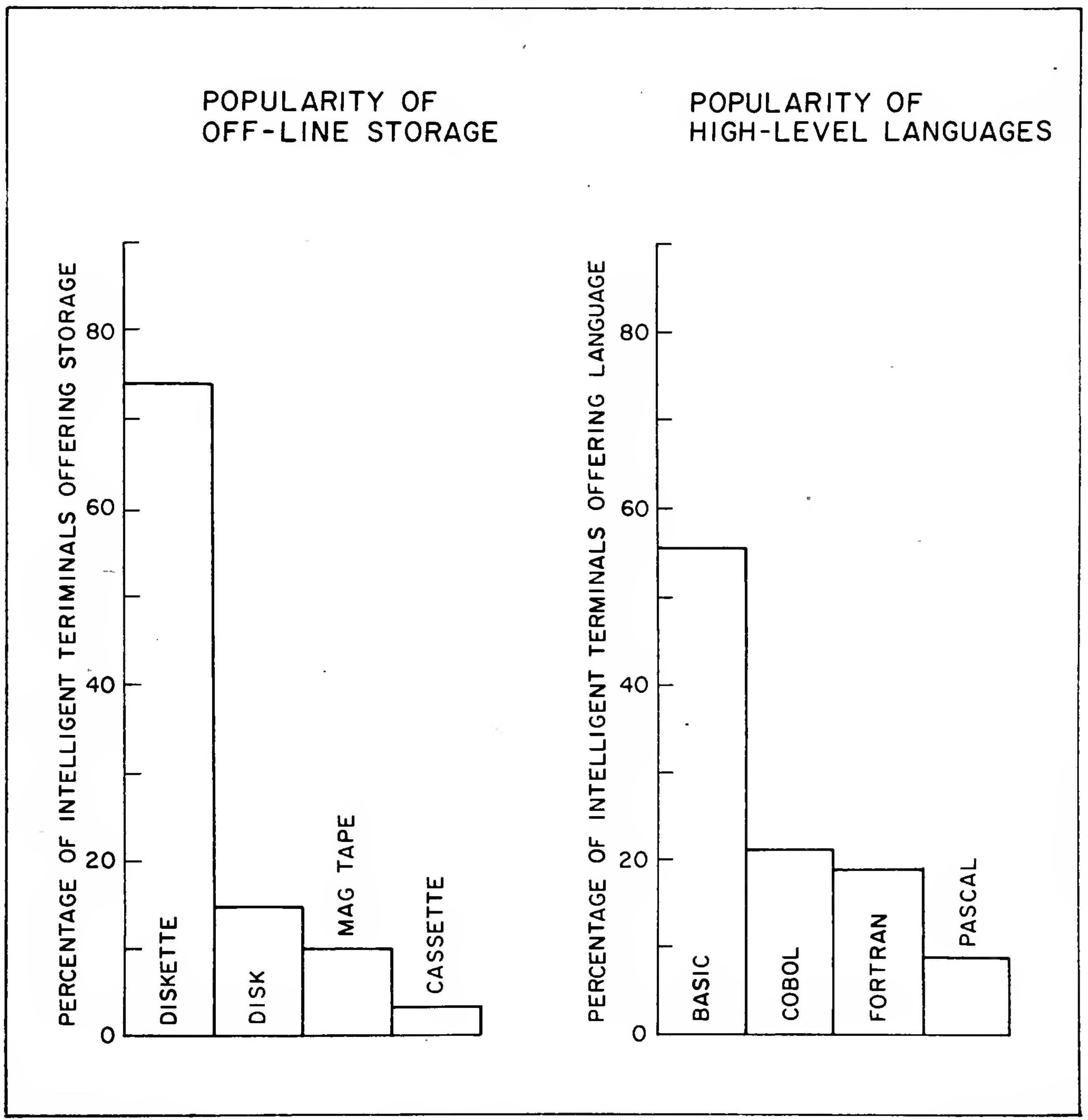
Intelligent terminals will certainly continue to play an important role in highly interactive applications such as word processing, graphics and transaction processing, where the use of local processing saves a great deal of CPU user time. As firm-

(Continued on SR/8)



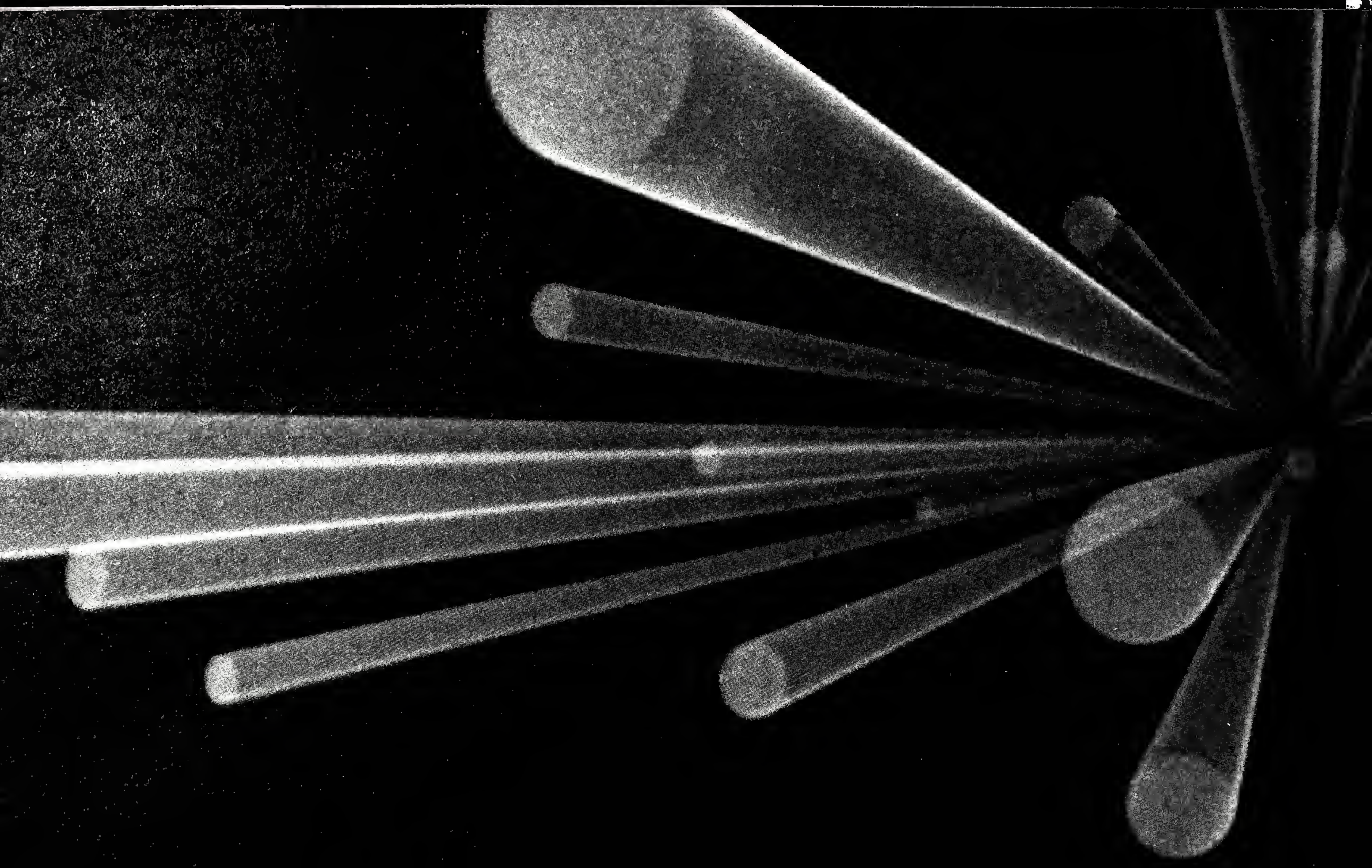
GML Corp. Chart

Figure 1



GML Corp. Chart

Figure 2



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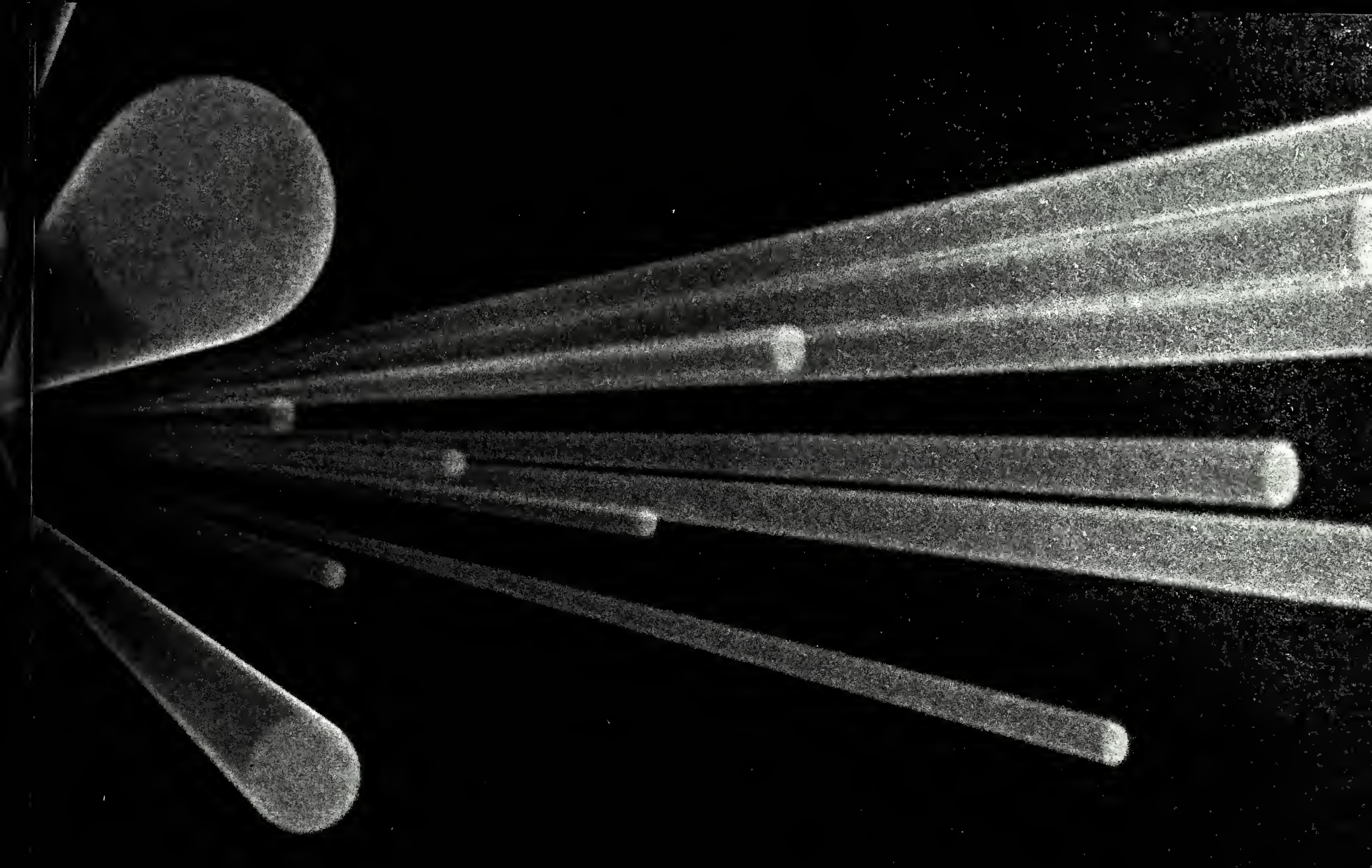

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The knowledge business

Packaging vs. Ingredients

Choosing a Terminal: Candy or Health Food?

By Gad J. Selig
Special to CW‡

Choosing a terminal today is like choosing between a candy store and a health food store. The candy store products tend to have flashy packages and rich ingredients, some of which are considered bad for your health. The health food store supplies products with basic packaging and unprocessed ingredients that are supposed to be better for your health.

Terminals today come in a wide variety of flavors, depending on function, price, capability and complexity — some of which could be bad for the health of your organization and some of which have a positive effect.

According to GML Corp. of Lexington, Mass., computer industry research and publishing company, there are more than 1,000 commercially available terminals offered by more than 300 vendors. Terminals are classified, according to GML, into more than 10 technologies. Some of these are dumb, editing, intelligent (which includes professional workstations), word processing, numeric only, portable, full graphics and point-of-sale terminals.

Most of the terminals that are marketed today are special-purpose terminals that can interface using a number of communications protocols, as well as software-driven terminal-based systems, which provide a broad range of capabilities.

A growing number of vendors are marketing and developing generalized terminal systems that include the hardware and software necessary for both word processing (such as document generation and editing, electronic mail, electronic storage and retrieval) and data processing (such as calculations, inquiry to internal/external data bases and graphics) applications.

An equal number of vendors are marketing specialized terminal systems that focus on definite areas such as voice and touch data entry, color graphics, computer-aided design, computer-aided manufacturing and decision support workstations for the professional.

It will be sometime, however, before a single, cost-effective terminal system will be able to satisfy the broad range of office and general administrative support requirements. For example, word processing, data processing, color graphics, voice, video conferencing, image, voice message and electronic mail support all levels of an organization equally well and operate reliably in different types of environments.

Motivation Questioned

In fact, while many vendors have identified the perceived need for these multifunctional systems, one questions what their motivation is. Has the need for these systems truly been expressed by users of the systems or have the vendors focused on a market segment where they can make a higher profit?

Those multifunction systems that are available today are relatively expensive in relation to "special purpose" systems. Undoubtedly, many users may not be able to justify these multifunction systems in pure dollar savings. It may, however, be appropriate for some users to establish some pilots and truly examine the full range of potential benefits and problems of these systems. There are vendors that offer single, multifunction terminal systems today. Some of them include:

- Digital Equipment Corp. — The Office Plus concept attempts to integrate word processing, data processing and communications capabilities in a single workstation called Decmate.
- NCR Corp. — The Worksaver system has been introduced to the word processing market, but with the apparent strategy of providing a full range of data processing and communications functions in the future.
- Xerox Corp. — The 8010 Professional Workstation — which is part of the Star System — provides capabilities aimed at satisfying a broad range of functions.
- Datapoint Corp. — The firm is marketing its terminal-based product line to the multifunction market. For example, companies interested in single terminal-based integrated systems handling communications, graphics, word processing and data processing.
- Wang Laboratories, Inc. — Through either the VS System terminal — which handles word and data processing functions — or the Ergonomic Terminal with Alliance software, Wang is providing a host of

(Continued on SR/8)

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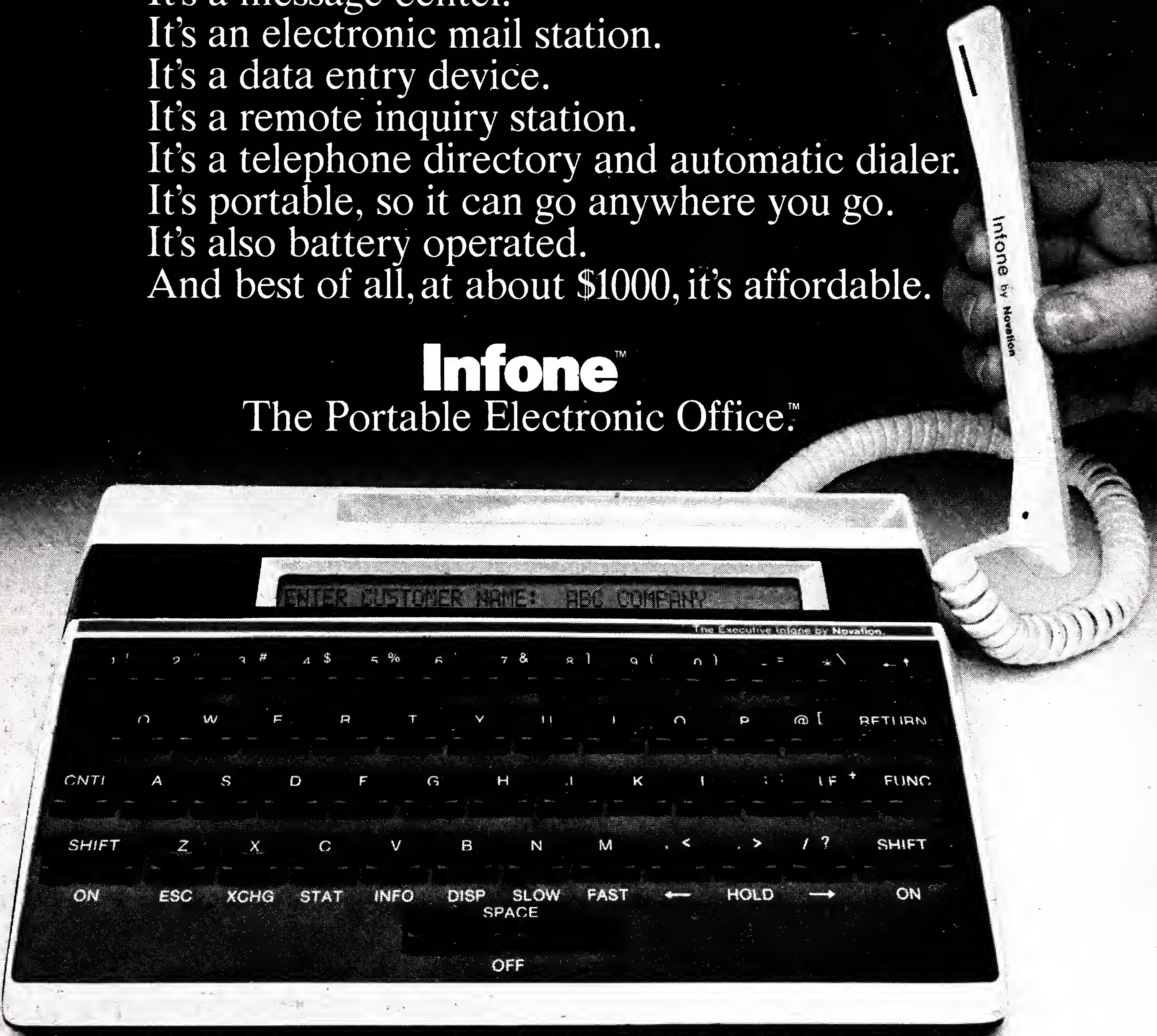
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Choosing a Terminal: Candy or Health Food?

(Continued from SR/6)

multifunction terminal-based systems.

- Personal computers. Companies such as Apple, Inc., Radio Shack, Commodore Business Machines, Inc. and IBM are providing modular and functional growth capabilities through the use of add-on "chips" to handle text processing, graphics and communications.

Many vendors have announced or are working frantically to develop multifunction terminal systems. They include Burroughs Corp., Hewlett-Packard Co. and Japan, Inc. Their purpose is, of course, to capture a larger segment in this dynamic market.

Other vendors are focusing their energies on microprocessor-based terminals as opposed to minicomputer-based terminals. Terminals that provide multifunction capabilities interface by using many different communications protocols and support operating systems like CP/M. Two examples are:

- Artel Corp., Palo Alto, Calif., which markets a Series 1000 terminal that supports both word and data processing applications. They provide software to interface with multiple host computers.
- Tano Corp., New Orleans, La., which markets the Outpost terminal. This device provides multifunction capabilities and has software available to interface with a variety of host computers.

Another way to provide multifunctionality to existing terminals is through the "black box" approach.

One company, G.O. Graphics, recently introducted a family of interface devices that it claims enables incompatible word processing systems to interface with other word processing systems as well as with other office and data processing systems. AT&T is working on a universal code converter concept which, in theory, should be able to interconnect many different vendor devices and networks.

Cost-effective multifunctional terminal systems appear to be a strategic objective of many vendors. In order to sell they will have to support many functions.

To succeed, the hardware and software architecture of these terminals must include the following: modularity, expandability, function-based on incremental costs (pay for what you need), communicability, reliability, ease of use, ergonomically pleasing list of vendors is marketing or requirements (such as graphics, function keys, screen size, color, language and dictionary).

As previously mentioned, a growing list of vendors is marketing or planning to market single terminal systems designed to satisfy multiple requirements. However, many of these systems are not necessarily cost-effective or justifiable for the applications they are being used for today.

In addition, it may be some time before a full range of single multifunctional terminal-based systems are available "off-the-shelf." For those users that require these capabilities now, a proprietary request for proposal to major vendors may be the only alternative.

Selig is director of technology and strategy for Contel Information Systems' Consulting and Technical Services Division (formerly Network Analysis Corp.).

Terminals Vary In Intelligence

(Continued from SR/3)

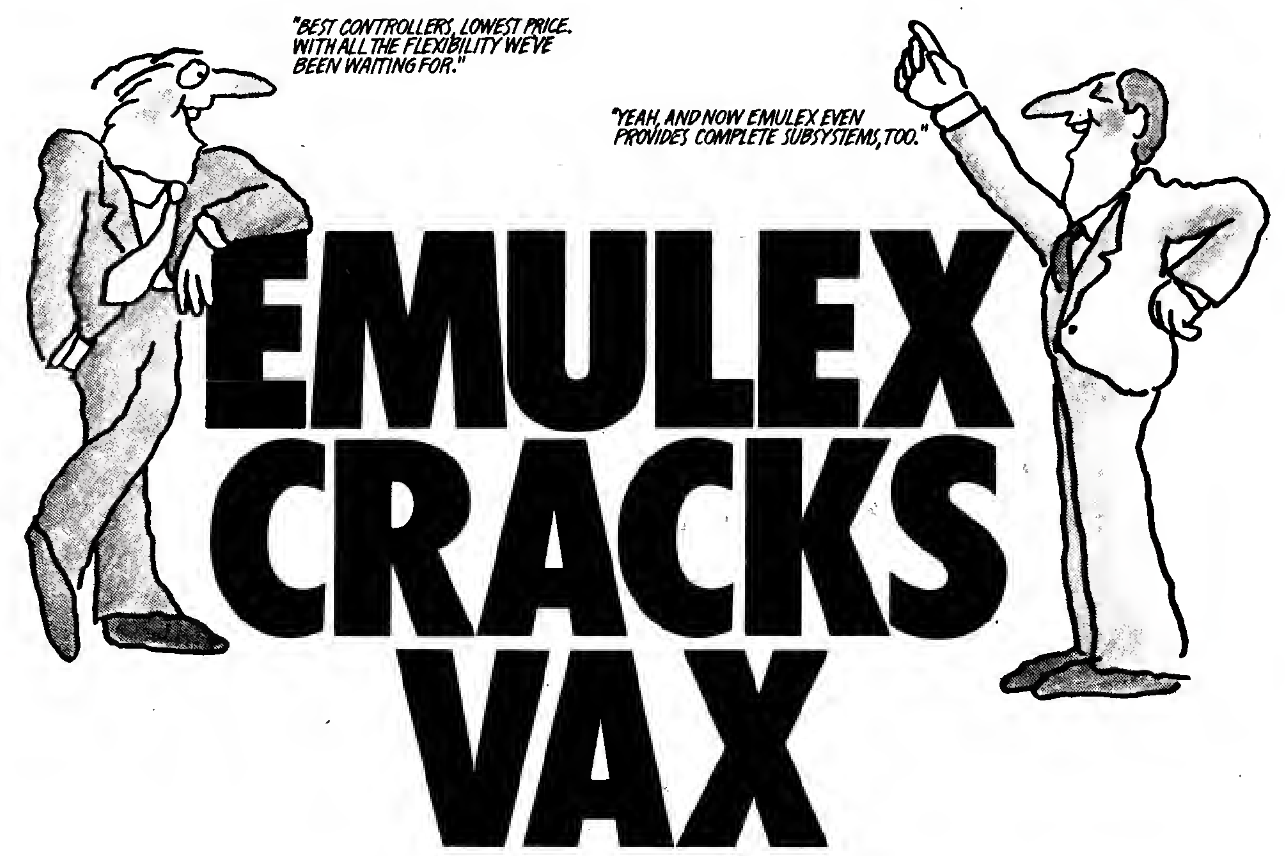
ware improves and the cost of featuers such as color and video attributes goes down, users will be more likely to find the need for word processing and graphics in the office.

One recent innovation in terminals that could appeal to users is the editing terminal-to-microcomputer upgrade, similar to that offered by Digital Equipment Corp. for the VT-100. The user anticipating a future need for local intelligence can start with a VT-100 and upgrade later.

If other editing terminal manufacturers make the same type of option available, many users will choose to stay with their terminal and upgrade rather than switch to an intelligent terminal. Intelligent terminal manufacturers could respond by making available upgradable editing versions of their terminals, but the editing terminal industry is already crowded.

The intelligent terminal industry is not yet well established, and it remains to be seen exactly how manufacturers will carve out a niche for themselves in the terminal/microcomputer marketplace. For now, there is enough of a variety of devices to enable most users to find the appropriate blend of intelligence, features, communications and price.

Freedman is editor of Computer Review *at GML Corp., Lexington, Mass.*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Must Support Multiple Capabilities

The Future Terminal System: What Will It Be?

By Douglas M. Pihl
Special to CW‡

The coming years will see an increasing need for the typical terminal user to access a large information base that is distributed throughout a network comprised of large mainframes, minicomputers, time-sharing services and even personal computers.

In this environment "information workers" will have at their fingertips data and computing power that literally may be on their desktops or on another continent. This distribution of computing resources and the need for convenient access to these resources will be the impetus behind the development of new terminal systems.

The 1980s will see an increasing variety of communications protocols and physical facilities being used. Protocols will include IBM's 3270 local and remote Systems Network Architecture (SNA) or non-SNA, asynchronous (Digital Equipment Corp. VT100 and others), packet switching (X.25), file handling (IBM's 3776) and others specific to local-area networks. Long-distance facilities such as switched networks, packet networks, satellite links and Direct Distance Service also will be widely used in conjunction with local media such as broadband, IBM channel, local-area networks (Xerox Corp.'s Ethernet, Wang Laboratories, Inc.'s Wangnet and so forth) and private automatic branch exchange.

What does this assortment of protocols and facilities mean to the typical terminal user? Since it is conceivable that many or all of these protocols and facilities might be used within one organization, the terminal system must evolve into one that supports multiple communications capabilities.

Dual Terminal Approach

Today, in many offices, users already are faced with the need for multiple terminals to access information and applications at large mainframes using a 3270-type protocol and at minicomputers using the asynchronous protocol. This dual terminal approach becomes less cost-effective and less convenient as the number of users increases. A system where one display can dynamically interact with the large mainframes, minicomputers and time-sharing services is the answer and the direction terminal systems must take.

Is a terminal system that would support such a wide variety of services a feasible idea? Certainly the hardware required to support these communications protocols and facilities is well understood and widely available, but few manufacturers have integrated these capabilities in one system.

Furthermore, the cost of a multiple communications system does not appear unreasonable, especially if it is implemented as a clustered system. A clustered system allows the cost of hardware to attach to different facilities and memory for protocol emulation to be shared by a number of user stations, thereby providing this access at affordable costs.

Lee Data Corp. has taken this approach in its 3270/Async Communications System. This clustered terminal system provides convenient and dynamic access to IBM or equivalent mainframes, through a 3270 interface, plus access to minicomputers and time-sharing service, through multiple asynchronous auto dial or dedicated communications interfaces. Lee Data's ability to combine 3270 and Ascii protocols in one system is the result of a system design that uses a microprocessor-based, multibus architecture. This design is extremely flexible and will allow the firm to address other protocols in the future.

Selecting a physical facility to provide an efficient communications network to interface an organization's decentralized data processing facilities and terminal systems is a difficult problem for companies to solve. Simple but effective approaches like Lee Data's Coax Eliminator, which reduces the amount of coaxial cable required to support multiple 3270 terminals, are a start towards effective networking. However, this addresses only the 3270 terminal, a small segment of the overall problem.

Other devices like teletypewriter terminals, copying and facsimile equipment and video presentation devices are being handled by specialized networks. Ethernet addresses a portion of this need by supporting teletypewriter or office-type products. What must be addressed is a

(Continued on SR/10)

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Study: Videotex to Boost Alphanumeric Sales

Special to CW

SAN JOSE, Calif. — Widespread use of videotex and videophone (CRT-equipped telephone) terminals "in the near future" will help generate shipments of "more than four million" alphanumeric CRT terminals in 1985, according to a study published here recently by Creative Strategies International, Inc. (CSI), a market research and consulting firm specializing in high-technology industries.

The report examined three categories of CRT terminal equipment: dumb terminals, with basic input/output capabilities; smart terminals, equipped with microprocessors and having editing capabilities; and intelligent terminals, which have user-directed programming capabilities.

Currently, some 205 vendors offer more than 400 models of CRT terminal equipment and "compete fiercely," CSI said, noting that the number of new entrants has slowed in the last few years.

It expects "an imminent shakeout in the dumb and smart terminal sectors," but added that there will be a counterbalancing "steady influx of new vendors." Other marketing trends include:

- Clustered intelligent terminals will be the biggest revenue producer during the next five years, but "unit shipments of dumb terminals will far exceed shipments of intelligent terminals."
- Although IBM dominates the smart CRT terminal market sector, independent vendors are "slowly eroding its market share in this area."
- Throughout the industry, there is a trend toward combined use of dumb and smart terminals despite the continued introduction of more intelligent terminals. Growing user sophistication, together with a desire for state-of-the-art intelligent terminals, is "offset by an uncertain economic atmosphere and continually declining prices for dumb and low-end smart terminals."
- The U.S. currently represents the largest market for alphanumeric CRT terminals, with slightly more than 50% of the worldwide installed base. U.S. manufacturers have supplied about 60% of this base. CSI predicted that both percentages will decline by 1985. "As the market grows, international installations will expand rapidly and an increasing number of these units will be supplied by non-U.S. manufacturers," it said.

Regarding technology, CSI believes that "during the next five years, computer terminals will offer more features for less money, greater reliability and easier servicing. These improvements will result from the increasing use of large-scale and very large-scale integration in terminal circuitry," trends that are "already evident in new dumb and smart terminals."

Although CRT terminals contain many inherent deficiencies, the study said, their cost and availability presently outweigh the advantages offered by alternative displays. Floppy diskettes remain the most popular mass storage devices.

The high access times and low-storage capacity of cassette tapes relegate this technology to limited low-cost applications. The high-storage capacity of hard disks and their fast access capabilities make them very attractive, but their high cost makes them unsuitable for widespread use in CRT terminals, according to CSI.

CSI is located at 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

New Terminals Seen for '80s

(Continued from SR/9)

more generalized network that will directly support these devices and 3270-type systems, while not excluding indirect interfaces to these through their specialized networks.

Broadband facilities appear to fit this generalized network profile. Broadband cable can accommodate 3270 terminal devices, cable tv signals, facsimile transmissions, plus a variety of low-speed terminal devices. All of these will be the information worker's tools for gathering information and therefore must be addressed by the communications network and the terminal system.

Computing resources that are private to the information worker are a key element in today's office environment. These resources are being provided by intelligent terminals, computer workstations and personal computers. The personal computer is now the key product in this area because it provides users with access to what will be the largest and most readily available base of software and application packages to date.

Users realize that many office and management functions are more effectively accomplished with a personal computer. The fact that many organizations are beginning to purchase personal computers in large numbers is adequate evidence. However, these personal computers must become more than just stand-alone computing devices.

The trends in office automation strongly indicate that the personal computer will become a component of the generation of terminal systems. Why integrate the personal computer in a terminal system? The personal computer can become an even more effective tool for the information worker, without changing its basic nature, if its potential is not restricted by the limited communications capabilities it now has as a stand-alone device.

Providing the personal computer with the many communications capabilities discussed earlier (3270, Async, broadband, X.25 and so forth) through a clustered communications controller gives users access to corporate data files and applications, timesharing services and specific information services like Source Telecomputing Corp.'s The Source.

The theory of providing personal computers as a tool to reduce the need for mainframe computing resources, for example, will become more and more valid as the users become more sophisticated. However, the need for information from other data bases will likely increase dramatically.

The area of data presentation probably is more wanting for basic improvements in hardware design than any other. Studies in ergonomics verify the requirement for high quality character presentation in monochrome and color displays, and users are becoming more aware of the positive impact a quality presentation has on productivity. Manufacturers have addressed optimized data presentation or are in the process of addressing it for specific applications.

However, the diverse applications like word processing, graphics, closed circuit tv and traditional data presentation that will be supported by a broadband network, for example, require that manufacturers begin looking towards a new generation of CRT terminals. Currently, there is not a display to support this application mix, at least not at an affordable cost.

Technological Reality

Will a display of this type ever be available? The technology exists to build a display that offers 1,024 by 1,024 dot addressable graphics, programmed symbol sets for normal data presentation and a direct video input for CCTV broadcasts.

A display to support the full mix of applications will be a reality. Its availability will greatly depend on whether the cost would be in an affordable range in the near future. So, for the near term, there will continue to be a variety of displays, each optimized to a particular application or a more limited range of applications.

The terminal system that supports multiple communications capabilities, personal computers and a variety of data presentations is inevitable. When it will appear will be based on how soon users realize its cost-saving and productivity potential and how quickly manufacturers can respond to that need.

Pihl is vice-president, development, Lee Data Corp., Eden Prairie, Minn.

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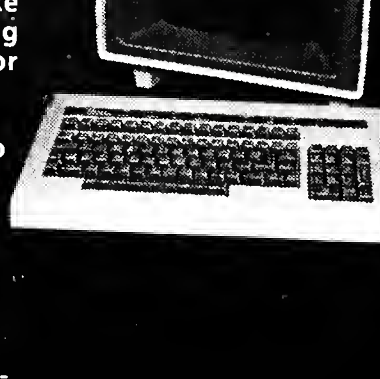

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And One in the Office

Setting Right for Terminal in Every Home

By Steve Tatum
Special to CW‡

A CRT terminal in every home and another at every office workstation may well become a reality during the 1980s.

They will obviously not be the same terminals. The home CRT terminal will be a no-frills device used primarily for information retrieval and costing about $400 from any of today's major department stores or Radio Shack-type outlets. At the office, the CRT terminal will be an intelligent device used for data manipulation, word processing and high-speed data communications. It will cost about $1,800, come as part of a package system and be obtained from an office products dealer.

Several things will have to occur before CRT terminals become as pervasive as I am suggesting. Let's first take a look at the home market. The potential is there, just waiting for the right set of circumstances for the market to explode. It needs only a low-cost CRT with modem, a strong data base of information and convenient retail outlets. All three are just about in place. What is needed to tip the scales is public awareness of the vast amounts of useful information just a keyboard and telephone line away.

Hardware/Software System

One scenario would be to place the terminal and a comprehensive data base service into a hardware/software system that could be marketed on a subscription basis. The home user who might not spend $400 for a stand-alone terminal could perhaps be convinced that for a low monthly fee, say $30 plus line charges, he could have a terminal plus access to a substantial data base.

This approach would be most attractive to that growing number of Americans who have a need to manage their personal finances. Many data base services offer an array of financial programs that help the user make decisions on investments, tax alternatives, property purchases and the like. There are programs dedicated to stock and bond market quotations and even to coins and stamps. Once a home system is in place, the user will naturally branch out to tape other programs available through the data base. New specialized data bases can be created when warranted by large numbers of CRT terminals in the home.

This same inexpensive home unit will provide a number of other services. Many progressive banks already have the technology in place to permit home banking through terminals and personal computers. Instead of letting their fingers do the walking through the Yellow Pages, home CRT owners will simply scroll through items shown on the terminal screen and key in their orders for groceries and other items. Subscribers to Source Telecomputing Corp.'s The Source, a data base service, can select from among 30,000 items in order to purchase various products.

As suggested earlier, intelligent CRT terminals and stand-alone microcomputers are rapidly converging in capability, with the differences between the two all but disappearing in a few years. In fact, the two may become virtually indistinguishable, each containing a dedicated microprocessor, 64K-byte random-access memory,

(Continued on SR/14)

Whisper Writer 1000 communicates via phone lines at 300 baud, TWX at 110 baud, and Telex at a proprietary 110-baud/66-wpm rate.

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In its standard configuration, the Whisper Writer comes with an internal modem, telephone jack, and programmable automatic answering feature. Options include a carrying case with acoustic coupler and an automatic line selector that lets you leave your Whisper Writer connected to both a telephone and a TWX line. A special version is available with an RS-232 interface in place of the standard modem for direct hookup to a computer, external modem, or CRT terminal.

When ordering any Whisper Writer, you can specify either a 40-column or 80-column printer. The unusually quiet thermal printing mechanism prints sharp, black-on-white characters at 40 cps and is able to produce graphics under the control of a compatible computer.

Editing memory lets you prepare text off-line.
Whisper Writer's four-page dynamic memory and editing features allow you to get messages and data letter-perfect before you dial. The result: lower phone, TWX, and Telex charges, along with less tying up of communications lines.

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Setting Right for Terminal in Every Home

(Continued from SR/11)

communications capability and a CRT screen in a single package.

These next-generation intelligent terminals will become universal devices, tying in all of the major communications protocols and operating as efficient data entry devices and stand-alone data manipulation stations. While the intelligent CRT business is growing rapidly today, the real market explosion will take place as office communications networks, such as Xerox Corp.'s Ethernet, become widespread. When that occurs, every office workstation will have a CRT terminal or personal computer.

Televideo Systems, Inc. is a good example of this trend. It is to become completely automated by the end of the year. The company will be using Televideo terminals and small business computers for all of its word processing, data entry and communications work.

Along with greater intelligence, memory and communications capability, another often overlooked trend is taking place in the CRT terminal industry. This is the "quiet revolution" of ergonomics. It does not attract the headlines given to new technical advances, but is every bit as important.

The terminal manufacturers that pay attention to the comfort and productivity of the equipment users are going to be the most successful. Today, the monthly salary of a CRT operator probably exceeds the price of the terminal. It makes good sense to obtain a machine that helps the operator to perform at peak efficiency.

Critical Area

The CRT screen is one critical area for operator comfort. The screen should provide high-quality contrast, reverse video, easy-to-read matrixes, clean, strong lines and characters and a jitter-free picture to reduce operator fatigue and eye strain.

At the keyboard, it is the operator who should be considered. The most successful terminals have useful function keys, familiar typewriter layout with keys that are easy to manipulate, a protected field that reduces the chance of operator error (and associated tension) and comfortable, tiered keyboards. These features all tend to increase operator productivity and satisfaction and will ease the transition from typewriters to terminals.

The use of these intelligent CRT terminals is not being restricted to the office. These terminals are being used on the factory floor in process control, quality assurance, inventory and other manufacturing applications. This is a trend we will see continuing throughout the '80s.

Graphics Growth

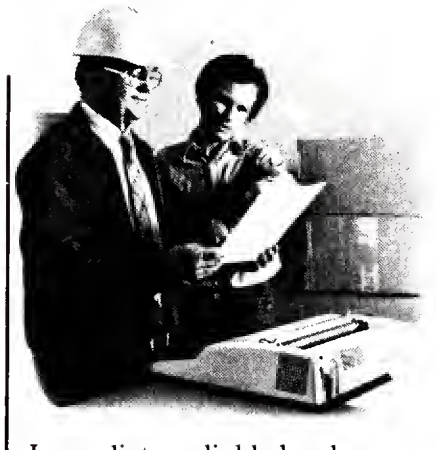
Graphics is another high-growth area for CRT terminals. Affordable and versatile color graphics capability awaits the arrival of a CRT terminal with 16-bit microprocessors to access the large amount of memory necessary to create color pictures.

By 1986, fully one-half of the terminals sold will have this color graphics capability.

This is an exciting period for the CRT terminal industry. It has grown from a highly volatile, immature business just a few years ago in a stable, productivity-conscious one.

As the inevitable home market develops and demand for intelligent machines increases to meet the requirements of communicating office networks, the industry stands on the brink of an exciting period of sustained growth.

Tatum is vice-president, sales, Video Display Division, Televideo Systems, Inc., Sunnyvale, Calif.



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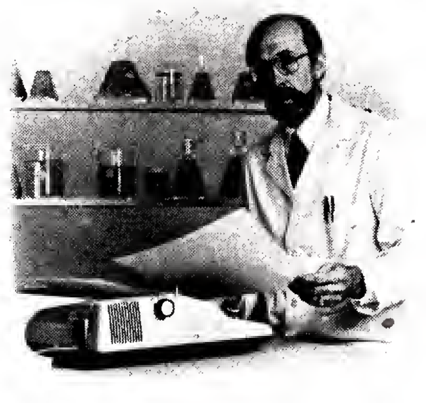

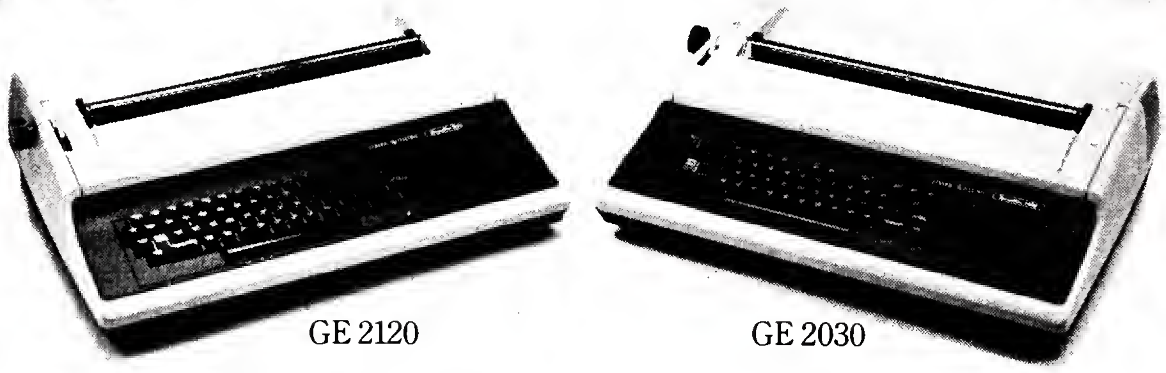

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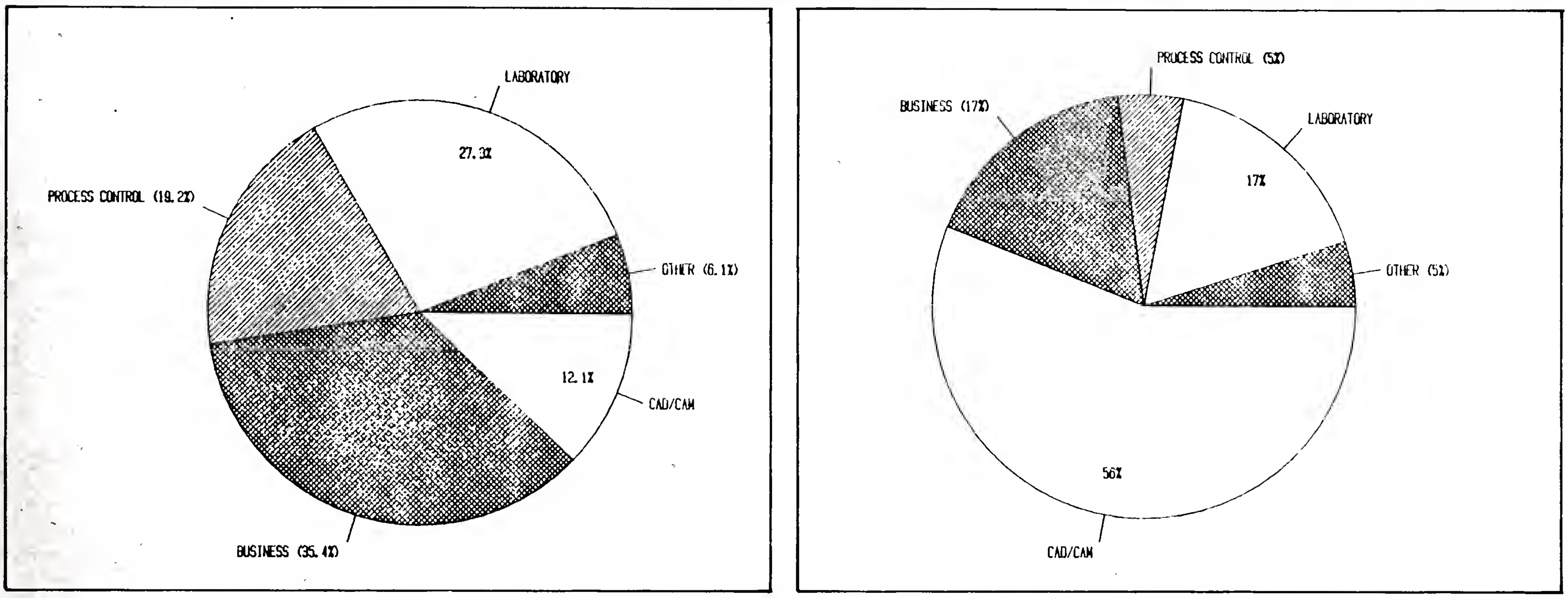
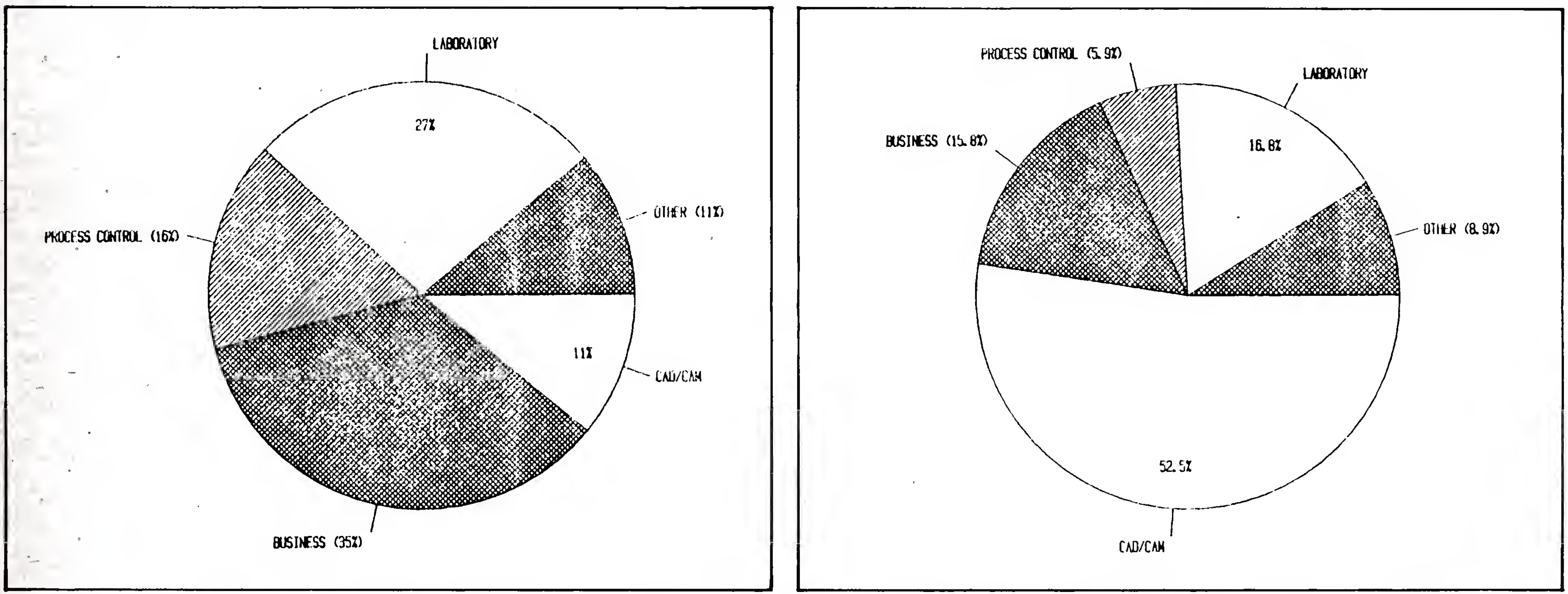


The 1980 Computer Graphics Market. Left: Terminal Sales = 50,940 Units. Right: Total Sales = $1.382 Million.



The 1984 Computer Graphics Market. Left: Terminal Sales = 225,180 Units. Right: Total Sales: $4.195 Million.

Visual Technology, Inc. Charts

Graphics Market Seen on Brink of Explosion

By Howard Gerstein

Special to CW‡

For many years, the computer graphics market has been predicted as an area ready to explode. It appears that the time is now near. With the development, availability and acceptance of software and associated hardware, graphics has become a sought-after capability. The industry is in an early stage of growth that seems likely to accelerate rapidly during the next few years.

The accompanying charts show projected growth rates and market shares from 1980 through 1984. They were developed as part of a study by Visual Technology, Inc. By 1984, the graphics market is expected to grow to over $4 billion. The computer-aided design and manufacturing (CAD/CAM) segment offers the largest sales potential; the laboratory and business segments, however, offer the greatest terminal potential.

The laboratory market is composed of sophisticated users. The predominant terminal used is the Tektronix, Inc. 4010 with Plot 10 graphics software. Because of this large established market, the 4010 and Plot 10 have become pseudostandards. Currently, most new terminal entries emulated the Tektronix 4010 to take advantage of the large amount of available software.

With graphics coming into wider use for laboratory analytic applications, however, a need is developing for more complex data representation, which in turn is making higher screen resolution necessary. Based on our study, a screen with a resolution of at least 512 by 512 pixels appears necessary to display analytic data adequately. We expect that in the next few years, higher resolution screens will become increasingly popular and that special peripherals — such as data tablets and joysticks — will be added to facilitate the creation and manipulation of data displays.

Advanced Business Uses

Although business applications of computer graphics are typically thought of as unsophisticated — requiring use of simple pie charts and bar charts to represent data — this situation is changing rapidly. Business users' needs for graphics are becoming more sophisticated, which makes it more desirable to have higher resolution.

With new and more advanced business terminal software, this increased resolution will enable users to employ special labeling fonts, to rotate text on graphs and charts and to view information with better defined and more complex figures. In addition, the integration of office automation, data processing and business graphics will require improved alphanumeric capabilities.

With the expansion of the graphics market, system configurations will demand that more users be connected to each system and performance be increased. This will foster a requirement to off-load onto the terminal some host-based software functions.

The terminals will increase feature content by including primitives to generate circles, arcs, rectangles and other presentation capabilities such as line styles and patterns. Although these are already available in many graphics products, nonstandard implementation as well as reliance on all-inclusive, host-based software has made it difficult to take advantage of these features. Standards are being worked on and will have an impact on this environment, as will increased demand for greater system efficiency.

Color has been a much discussed feature, but for many applications in the laboratory and business markets, color is of questionable utility. Color terminals and hard-copy devices are considerably more expensive than comparable monochrome units. Multiple color reproductions from a color original are also expensive and inconvenient.

Software that makes appropriate use of color has not been updated in many areas and is not widely available. The resolution of color monitors is low compared to monochrome units, which reduces their alphanumeric capability and graphics quality. In addition, because of their wide exposure to Tektronix and Hewlett-Packard Co. terminals, lab users are accustomed to monochrome.

These deficiencies will be resolved in the future to make color more viable and more widely applicable. While the business user is likely to accept color, ultimately penetration will be constrained by hard-copy and color reproduction capabilities in the short run. Another inhibiting factor

(Continued on SR/16)

Communications Network Spreads the News

Special to CW

EUGENE, Ore. — An independent daily newspaper here recently added a centrally controlled data communications network that extends the capabilities of its system.

The Eugene *Register-Guard*, with a circulation of 70,000 in Oregon's second largest city, added a network based on the Timeplex, Inc. Series II Microplexer family of statistical multiplexers/data concentrators.

The network extends the system in Eugene to the publication of local papers in the Portland area, 100 miles to the north.

This network, which employs a Digital Equipment Corp. 11/70 as the central node, links three remote sites and is composed of 44 terminals of six different types. A total of six newspapers, having a combined circulation of 93,000 twice weekly, are linked to the system, which is used by the editorial, advertising, typesetting, composing and business departments. It is believed to be the largest remotely run newspaper operation in the country.

Essentially, the network links the *Register-Guard's* host processing facility here with specialized newspaper terminals at three sites in and around Portland. They permit computerized publication of the recently acquired Times Publications group of six weeklies and semiweeklies.

All three remote sites are equipped with editing and classified ad terminals, plus console printers. One site, in Beaverton, a Portland suburb, is also equipped with business terminals, a phototypesetter and a line printer. All devices can communicate with the host computer here in Eugene.

Major Hurdle

The major technological hurdle to instituting this remote network was the nonstandard, in-band protocol employed by most of the terminals. The problem was to effectively multiply in-band protocol while at the same time handling standard protocol devices. "In fact," the *Register-Guard's* data processing manager Richard Mooney said, "three-quarters of our terminals are VT61s, which employ a kind of homegrown in-band protocol."

The *Register-Guard* also needed a multiplexer that could handle terminals with diverse transmission characteristics. In some cases, data would have to be passed back and forth interactively at high speed. In others, it would be buffered temporarily in the terminal and transmitted in blocks of 2,048 characters.

"After investigating several makes and models of multiplexing equipment," Mooney explained, "we chose the Timeplex Series II Microplexer. Because of its architecture, which provides a microprocessor dedicated to every four channels, the Timeplex stat mux showed that it could handle even the most unusual protocol by examining data streams at 9,600 bit/sec and responding in real time.

"We ran tests where we shut down one line, then the other. The network slowed down, but it kept on functioning. We ran response time checks where we loaded up a number of terminals, had users hit the enter key at the same time and found that it had very little perceptible effect."

These tests resulted not only in the *Register-Guard's* purchase of the Microplexer, but also in an announcement by DEC that Timeplex had a workable, cost-feasible hardware solution to statistically multiplexing its devices, enabling reliable implementation of a remote network.

One of the major applications of the *Register-Guard's* datacommmunications network is to process news stories. For example, a reporter in Beaverton uses her terminal to write a story. The story is sent to Eugene via the network, is stored here on a disk, then is run through an automated check for correct spelling. After the reporter is satisfied with the story, it is passed to her editor's terminal in Beaverton. The copy, after being approved, is automatically hyphenated and justified, then transmitted back to Eugene where a number of layout functions are performed. Retransmitted to Beaverton, the story goes through a phototypesetter that produces a composition-ready film copy.

Many of the columnists who appear in the Eugene *Register-Guard* are picked up by one or more of the local papers in the Times chain. Some of the Eugene paper's news stories are also reprinted. All stories and columns are entered here on a queue that editors of the locals can access through their terminals. The editors can also have the texts of selected columns and articles transmitted over the network. After the copy has been edited it is transmitted to the phototypesetter.

The network also permits all of the newspapers to share AP and UPI wire services and to send interoffice messages, which produces considerable savings in telephone bills and wire service charges. Emergency backup protection is another key benefit. The network links the phototypesetting facilities of the Eugene *Register-Guard*, the Times chain and the Vancouver *Columbian*, just across the river from Portland, so if one system goes down its workload can be shifted to the others. Since newspapers insure themselves against loss in the event they cannot publish, and the cost is proportionate to the risk, this network linkage reduces the outlay.

"The network also helps us satisfy our auditors," Mooney added. "They want important financial information physically removed from our building each night. So we encrypt the data and transmit it to the *Columbian* for overnight storage on dedicated disks. They do likewise, and we store their data on our central 11/70 system."

Graphics Field Seen Growing

(Continued from SR/15)

is that the advantages of color for highlighting and differentiating data can be achieved in monochrome displays in different ways. Currently, monochrome displays dominate in most general laboratory and business applications.

Buyers of computer graphics equipment, software and services have generally been insensitive to price. As the market matures and as computer graphics applications become more commonplace, price will become more important. Price insensitivity with respect to the purchase of terminals in sophisticated graphics systems such as CAD/CAM is due in large part to the low cost of terminals relative to total system cost. For applications in which the terminal represents a large portion of the graphics system, where larger numbers are employed, price is an important purchase determinant.

Gerstein is product marketing manager of Visual Technology, Inc., Tewksbury, Mass.

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Just First Line of Defense

Passwords Not Only Way to Protect Terminals

By Alan Berman
Special to CW‡

Whether it is a CRT or a typewriter terminal, connected by a coaxial cable in a local or remote cluster or by a modem that accepts a standard telephone receiver, the terminal is the most visible (and often the most vulnerable) link in the DP system.

Security measures are needed for the terminal to provide an environment that can prevent illegal entry to the teleprocessing network and protect information from accidental or unauthorized change or destruction.

When most DP users think of security measures for terminals, they think of passwords and user IDs. Password security, however, is only the first line of defense against unauthorized use, and thought should be given to augmenting this security method with a physical protection device.

There are three categories of physical identification. The user can be identified by:

- Unique possession (something only one person has).
- Unique attribute (something only one person is).
- Unique performance (something only one person can do).

These categories differ in approach, installation cost, required maintenance and the degree of security provided. Their fundamental aim is to provide a mechanism that uniquely identifies each terminal user.

Unique Possession

This category encompasses portable identification items that are inserted into a device permanently attached to the terminal, resulting either in recognition (and entry to the next phase of identification) or rejection (and exclusion from the system).

Terminal Lock and Key. The most common device, and probably the one in longest use, is the terminal lock and key. Its strength lies in its simplicity of operation: Insert the correct key into the lock, turn it to the proper position and the terminal is ready to communicate. Installation is usually an option provided by the manufacturer and the cost is relatively low.

In spite of its ease of use and relatively low cost, there are three major drawbacks to this physical security measure:

- Employee carelessness/complacency.
- Ease of penetration.
- Lack of flexibility.

Employee carelessness/complacency. Personnel tend to find removing a key from a lock (when they are not using the terminal) a bothersome task. The tendency is to put the key in the terminal in the morning and remove it only when the employee is ready to leave for the day. This type of carelessness and complacency can be curtailed by having supervisors conduct periodic inspections during normal working hours and having building security staff make inspections during evenings and weekends.

Ease of Penetration. The second drawback to this form of physical security is the relative ease with which the system may be penetrated. As with any lock, it can be opened by forced entry or use of an unauthorized key.

Forced entry can be accomplished by using a device (screwdriver, nail file and so forth) that, when inserted in the lock, damages the lock cylinder to the extent that it can be opened. Because the act itself is also easy to detect, this method is seldom used.

A more common method of forced entry is to pick the lock. This is done by using a lock-pick device that (when used by a fairly skillful individual) permits turning the lock without a key. One advantage to this method is fairly obvious: There are no signs of forced entry. In addition, the person can gain access as often as he can pick the lock without being detected.

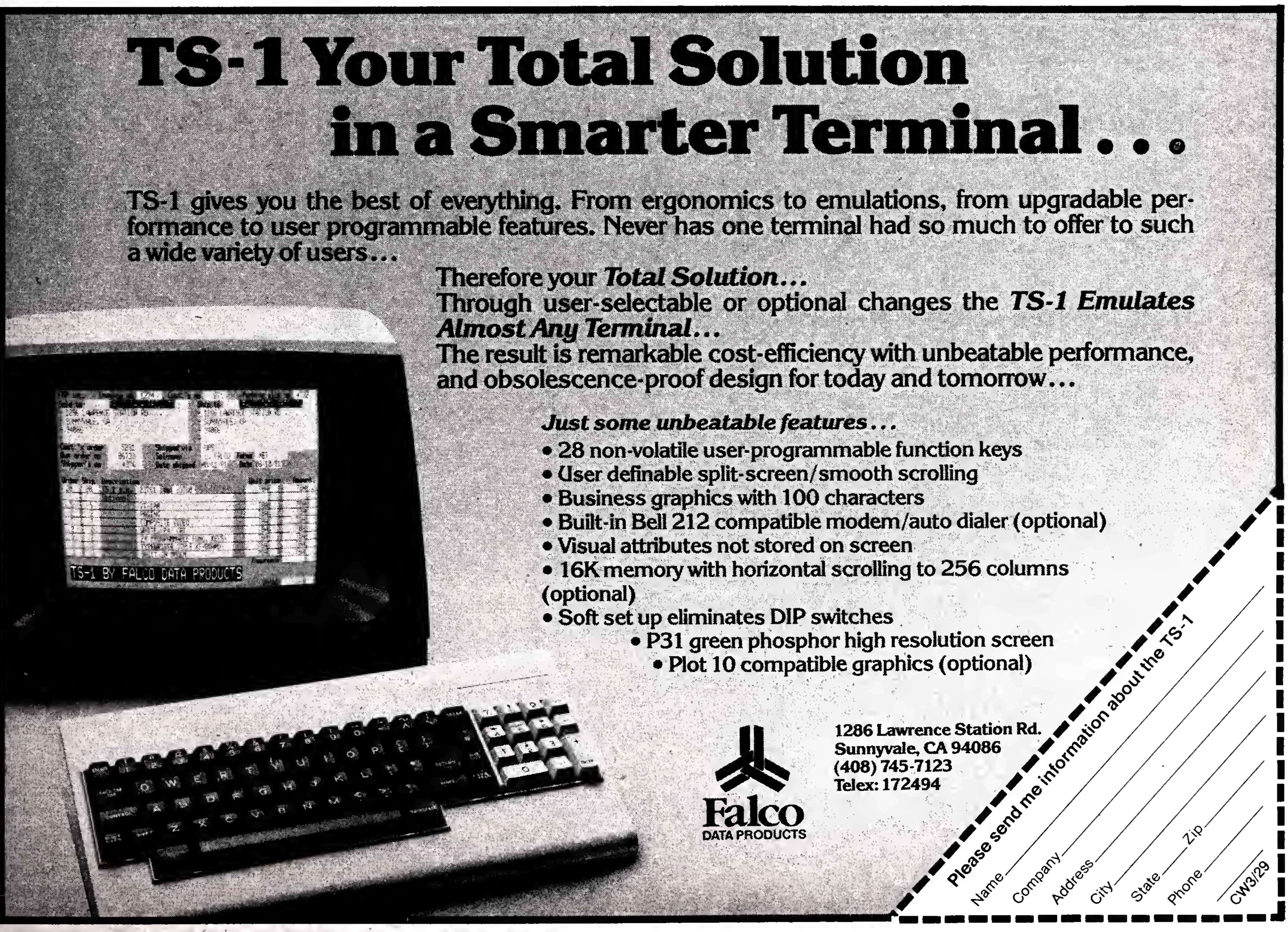
Although forced entry is a threat to terminal security, the probability of this method of penetration is small compared with the use of an unauthorized key. This is a copy made from an authorized key that has been stolen or found unprotected. If someone realizes that a key is missing, he is more likely to cover up its disappearance than to admit carelessness in guarding the key.

Sophisticated Locks

To protect against the use of forced entry and unauthorized keys, methods that are commonly used for home protection can be used for system security; that is, better locks and keys can be installed. Such locks may be cylindrical, "pick-proof," and even magnetic. The more sophisticated the locks and keys, the more talented and inventive the terminal invader must become.

Lack of Flexibility. The greatest drawback to lock-and-key security is its inflexibility: it allows only a small group of people to access a terminal. Issuing more than three or four keys to a terminal increases the chance of keys being lost and of people waiting

(Continued on SR/18)



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Terminals Protected by More Than Passwords

(Continued from SR/17)

for access to a particular terminal. Conversely, it would certainly not be manageable for an employee to have a key to more than one terminal.

Magnetically Encoded Card. This device, about the size of a credit card, is equipped with a strip (usually black) that has been magnetically encoded with a machine-readable identifier. The card is inserted in a specially designed magnetic card reader connected to the terminal by cable. The magnetically encoded identification number is then transmitted for verification to a control file at a central location.

This number is then matched against the file to determine whether the individual may use the terminal. The degree of eligibility can be general (allowing the individual to use any terminal) or very restrictive (limiting the types of input, hours of eligibility and terminals that can be used).

Magnetically encoded cards are more expensive to use than keys and locks because additional equipment (card readers and cables) is required. Some maintenance is involved — the card reader may malfunction and it must be adjusted to correct alignment problems. Maintenance is typically minimal, however, and malfunctions are infrequent. Cards can be replaced quickly and at reasonable cost.

To a large degree, the three basic inadequacies associated with lock-and-key security can be avoided using magnetically encoded cards. In order to ameliorate the problems of employee carelessness and complacency associated with physical security devices, the magnetically encoded cards can also be used as identification throughout the organization. This encourages the employee to carry the card at all times in order to enter the building, to gain access to the company cafeteria and to cash payroll checks.

Using cards instead of keys and locks also greatly reduces the risk of penetration — it is not a simple task to pick a card reader. Since the security device is electronic rather than mechanical, the degree of sophistication necessary to penetrate it is generally far beyond the ability of most employees.

Finally, the magnetically encoded card is far more flexible than the lock and key. It can fit into any reader and thus allows the operator to use any terminal in the system. Access can be reduced by limiting the use of certain terminals to certain operators, but limitation is a function of the verification file software, not the card reader itself. Even when a card is lost or stolen, no hardware changes are required; the verification file is updated to make the card invalid for terminal operation.

Unique Attribute

This category is composed of anatomical identification devices that recognize some part of a person that uniquely identifies him. Two common methods currently use such a methodology: fingerprint and palm print identification. A hand-shaped device is attached to the terminal. When the user places his hand in the appropriate slot or groove, sensors in the device transmit an electronic translator to the host computer. The host searches its files for a match to identify the user.

To invalidate users, the verification file is updated to reflect the change. The process is similar to that used with magnetically encoded cards.

Research is currently being performed in the area of facial identification. The user terminal is equipped with a closed-circuit camera that transmits the user's image to a centralized site for verification.

Unique Performance

Performance identification devices uniquely identify a user based upon an action taken by that user. In practice, there are two methods that have met with some degree of success: voiceprint and signature analysis.

For voice prints, the operator uses a speaker attached to the terminal to relay a predetermined message to the host. The electronic equivalent of the vocal message is compared to one previously recorded and encoded. A match identifies the user.

The use of signatures as an identifier is very common. Two methods are used to verify the identity of the user. The first is the more traditional means of comparing the submitted signature with the verified one on file. The second method is to measure that impulse time required to initiate the signature. Signature initiation can be confirmed by measuring this impulse time.

Berman is a security consultant in Irvington, N.Y. This article is an excerpt from a portfolio entitled "Security Consideration for Terminals," which appears in Auerbach Data Security Management.*© 1981 Auerbach Publishers; reprinted by permission.*

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Some Purchasing Hints

Users Facing Complex Choices in Terminals

By G. Stuart Bain
Special to CW‡

Because there is an ever-increasing availability of new data communications terminals, choosing the right equipment to satisfy one's own particular requirements becomes more complex every year.

Too many users purchase equipment that either does far more than the users will ever utilize or that has limited capabilities. To strike a happy medium is somewhat difficult, but not altogether impossible.

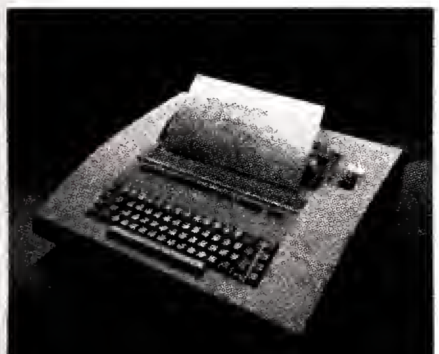
The primary consideration of the purchaser is to carefully analyze and evaluate the functions he would want a terminal to perform and identify those capabilities deemed essential as opposed to those considered "optional extras."

After identifying the equipment needed, it then becomes necessary to search the market for those terminals that fall within the parameters you have established. It is quite conceivable that you will finish up with a list of 15 or 20 terminals that will satisfy your needs within the set parameters.

Now comes the hard part. Before resorting to flipping coins check some of the following criteria:

Cost. When checking cost, be sure all terminals being compared have

(Continued on SR/20)



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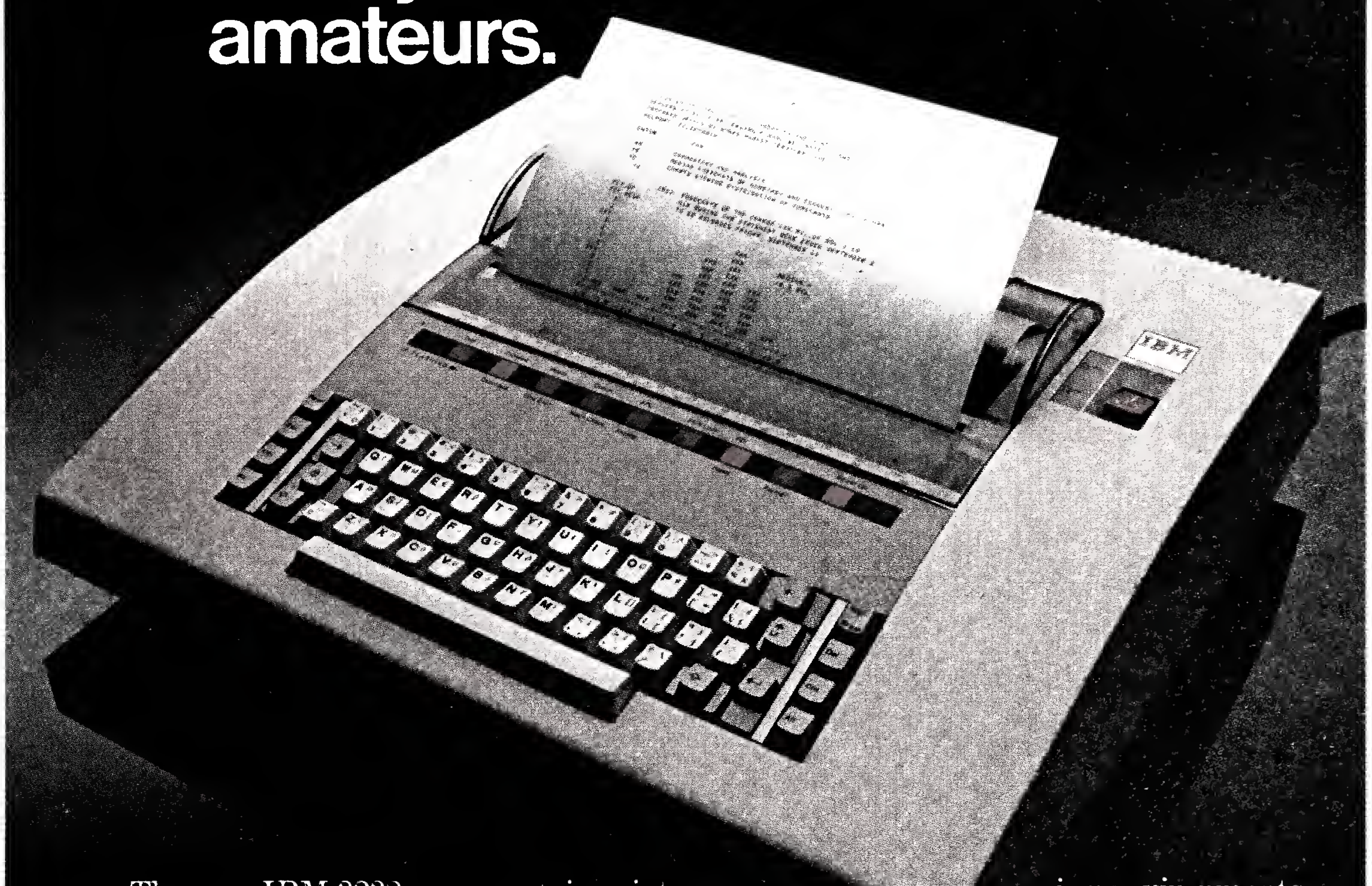

The new IBM 3232 Model 51.

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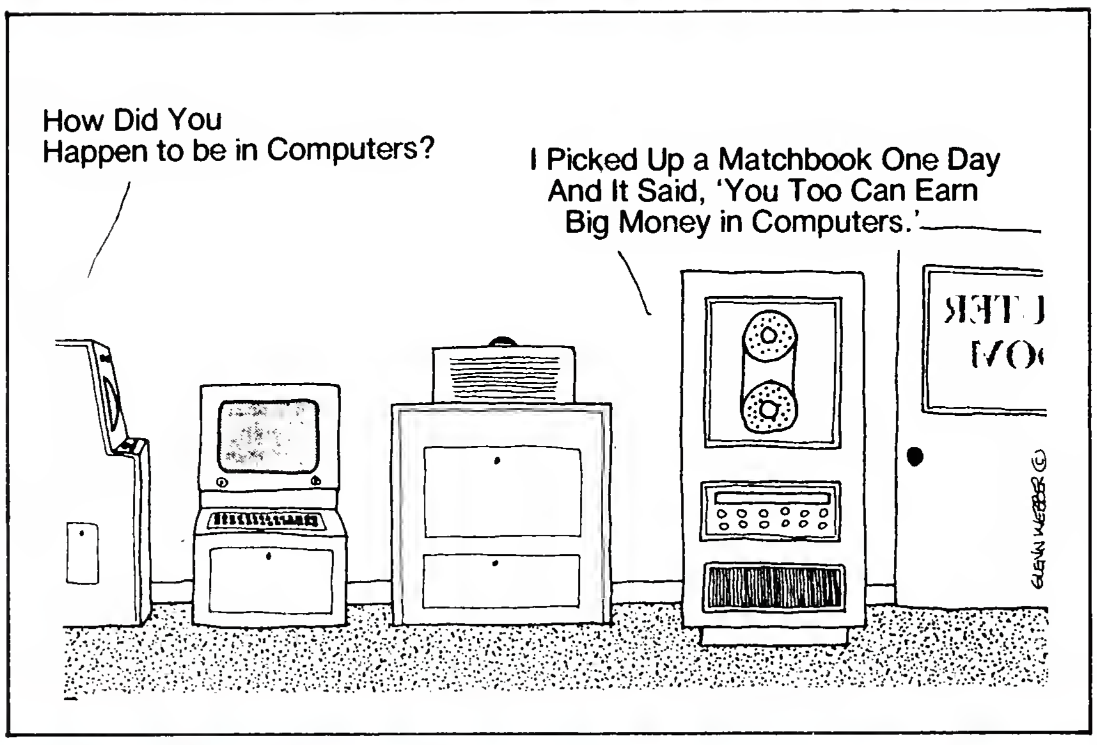
How Did You Happen to be in Computers?
I Picked Up a Matchbook One Day And It Said, 'You Too Can Earn Big Money in Computers.'
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Complex Choices Face Users Buying Terminals

(Continued from SR/19)

the same capabilities. Furthermore, look into the cost of the various means of acquiring a terminal — lease, rental, purchase option, deferred payments and so on.

Serviceability. How is the equipment to be maintained and by whom? Are there additional costs for this service? Check with the local service organization and from the terminals on your list identify those that have a high frequency of service requirements.

Operability. How do your operators feel? Are they "at home" with the equipment?

Some specifics to ask operators might be: Does the screen flicker? How about glare? Does the keyboard have the right touch? These types of questions can be extremely important to an operator who might spend many hours per day in front of a terminal. Check the ease of operation. Will it take a three-week training course to learn to operate or can one learn how to use it in two hours?

Support. What kind of after-sales support can be expected? The answer to this question will obviously vary depending on where the equipment is purchased, from whom and the means of acquisition — lease, rental or purchase.

Obsolescence. This article started with the statement that the availability of new equipment was increasing rapidly. If this statement is correct, it is safe to assume that much of the new equipment is outdating the old equipment.

Therefore, one should evaluate one's long-term requirements and ascertain whether or not it is possible to "add on" or update initial terminals or maybe investigate methods of acquiring equipment that does not preclude turning in the "old" for something "new."

Remember, nobody wants old, obsolete hardware. If you are relying on a good return on the sale of obsolete equipment to help finance the purchase of new equipment it might be disappointing. One only has to look at the trade journals to see the deflated prices being asked for equipment that in some cases a few months previous was being sold at prices sometimes double that of today's prices.

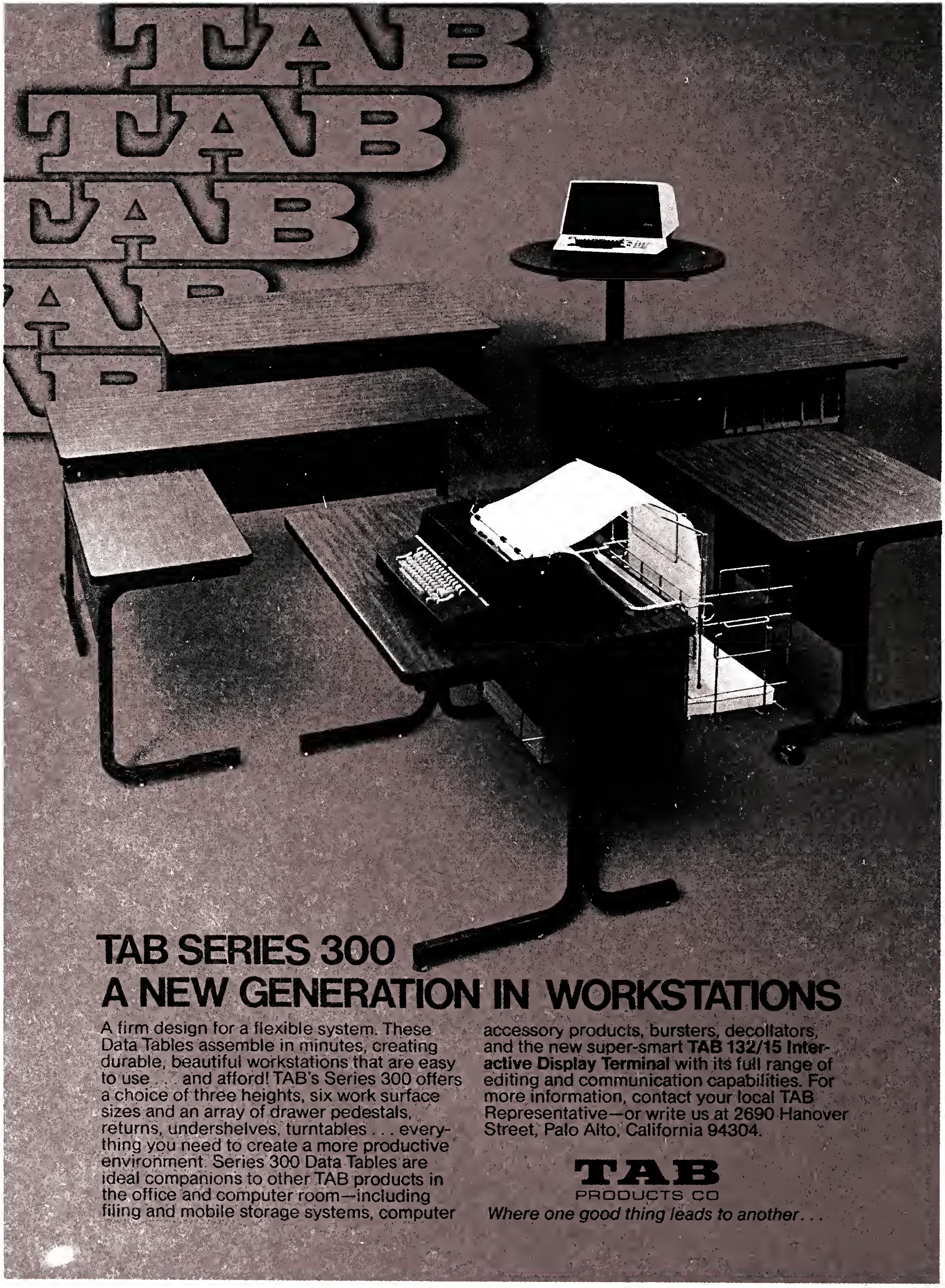
Availability. After going through the exercise of identifying needs and determining which particular "box" will best satisfy requirements within your present parameter, it is extremely disheartening to discover a particular box will not be marketed for another three months, and in all probability will take another three months before delivery can be expected.

Too often one's requirements are such that the terminals, after being identified, need to be incorporated into the system immediately. The urgency of your requirement might very well determine the means of acquisition — rental or lease as opposed to purchase.

After analyzing and evaluating various products using the above criteria, take a look at the products readily available with any number of leasing or rental companies.

These companies spend a lot of money in order to determine which terminal will be the most profitable. The companies obviously consider all of the prementioned criteria, including a few more that affect their decision as to where to buy, what to buy and when to buy.

Bain is manager of data products at United States Instruments Rentals, San Mateo, Calif.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Videotex One Solution

Interface Standard Seen Key to Terminal Use

By Nelson Hilton
Special to CW‡

A terminal is an "end point," a terminus. As such, it is also a beginning. The problem with terminals today is that they are all dead ends and no beginnings.

What we need to do is reformat the idea of what a terminal should offer and where we can go from there. We need, as the Latin tag has it, a *terminus ad quem.*

To open up the computer age, information society, mass-market potential or however one chooses to view the social options, it is essential that we institute a common terminology. It is essential that we achieve a standardization of interface between the user and the machine — that we create an interface permitting us to access everything and everyone everywhere, a meta-terminal.

Interface Standardization

The standardization of the interface will have as its foundation the unique identification of every item or document available for retrieval, every terminal and personal address for communications and every program that may be selected for operation by the user's system. We must realize that the capability least utilized by terminals at present, that of communicating and retrieving information by videotex, is that which promises the greatest development and benefit.

Getting civilization on-line and interactive will entail more concern than pushing computer games and word processing into every household. Videotex is the term used thus far to describe those broadcast and interactive systems that use a decoder and television set for receiving and displaying alphanumeric and graphics information. The U.S. is far behind Europe and Canada in the development of such systems.

We should be able to enter work at a terminal and send it to any other in the world by telephone, cable television, satellite or other means. Or, if we wish, we should be able to make the work immediately available systemwide (worldwide) where it can be brought to the attention of those interested by their computer-terminals programmed to scan on a periodic basis the latest index entries for the selective dissemination of information.

A True Information Society

As virtually all public information becomes available in machine readable form, every family, office and library (public terminal and mass storage) should have videotex access to that information. "Hard" reproduction would of course be a peripheral capability. Only when we have easy and universal access can we truly speak of an information society.

Given the different emerging videotex systems — containing all types of information available to the public — the central and pressing question is how can we find out what is available and obtain access to it. The problems are technical and institutional.

The technical problem is the interface of different systems. The institutional problems include the organization of all the data in all the different systems, access and account keeping.

It is clear that developments in technology and the introduction of videotex systems will require new terminal hardware capable of handling both videotex and current on-line systems. These new terminals should be designed to provide the most efficient retrieval of information from the multitude of sources.

In the past 15 years, Dr. Howard J. Hilton has been developing a concept that integrates terminal hardware, software and data base structure in a system that any literate person, without special training, could use to obtain access to all available public information stored in any on-line or videotex system.

This concept incorporates broadcast videotex for current information, topical and index updates. The potentially overwhelming ocean of information requires a detailed indexing system that will utilize computer searching (or browsing) according to individual desire.

Practical Universal Code

The objective is to provide a single index and retrieval system covering all recorded knowledge and information capable of being retrieved from all modes of storage. This concept of practical universal code is called the Hilton Universal Code (HUC). There has been little public

(Continued on SR/22)

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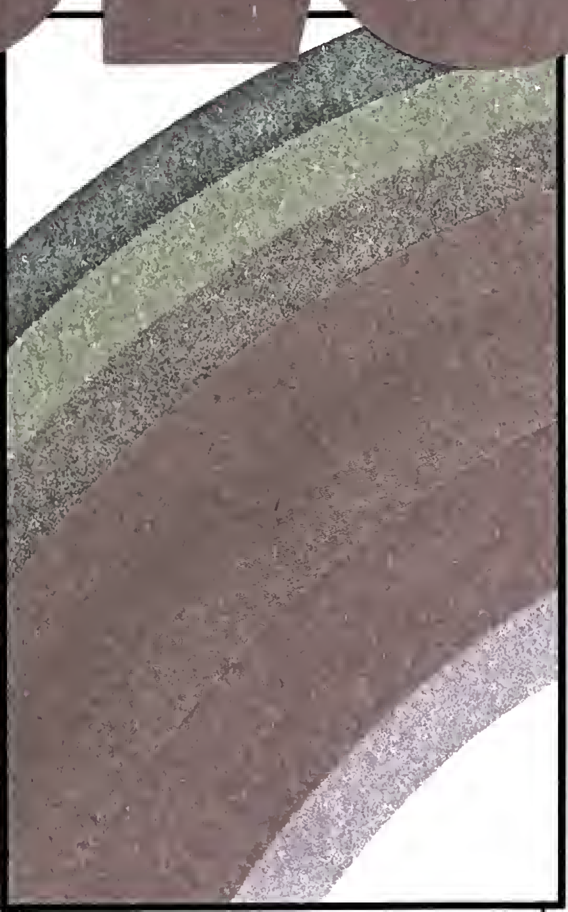

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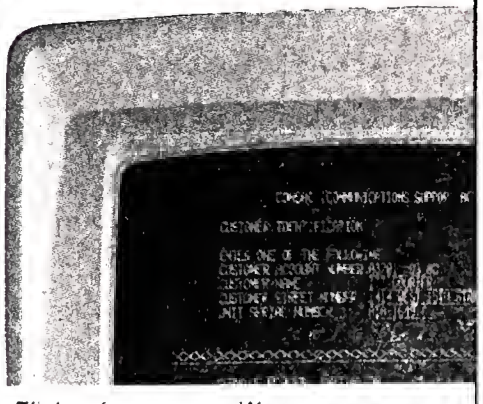

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Standards Offer New Options for Terminal Use

(Continued from Page 21)

effort devoted to the solution of the institutional problems involved in storing, retrieving and distributing the world's knowledge. And this, in a real sense, is the terminal problem for our time. By all indications, it will be resolved in sloppy, wasteful, short-sighted fashion. HUC offers an alternative.

As a code for the unique identification of all recorded public and private information (documents, personal letters, orders, bills, electronic funds transfer, sensor data and so forth), HUC offers in its maximum configuration a 61 column alphanumeric identifier. A special character generator expands the alpha characters to 63, allowing for international transliteration using Ascii and, for the identifier, an inexhaustible identification of $+10^{70}$ bits.

Dividing the Identifier

The identifier is divided into a mnemonic or numeric section for unique identification and a supplementary section containing information for computerized manipulation (indexing, searching, abstracting).

The identifier is also divided into 15 fields (including check characters) covering, as appropriate, type of source, status, date to second, medium address, copyright royalty account, language fields and special field designations including mass density storage addresses, uniform product codes, special use designated by source (time to nsec, for example), subject categories of the Library of Congress and document identifiers for other existing data bases.

To deal with message traffic, HUC supposes the organization of a system of national, regional and local nodes, each of which would serve as a buffer mediating identifications between source and address. A national node (Prestel in England, Bildschirmtext in Germany are on-line systems already underway) would issue the HUC source identifier, maintain real-time communication with other national nodes, maintain duplicates of all HUC files and provide support to local nodes by initial broadcast, requested broadcast, interactive videtoex and video-disk index replication in the required language.

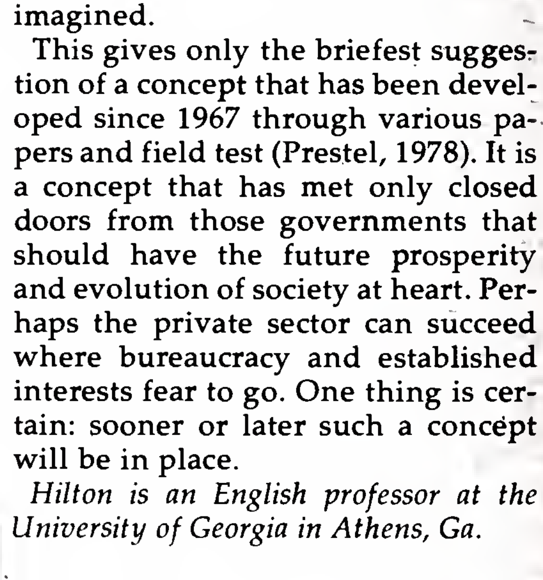
Medium for Storage

The medium for storage in the nodes would, in most cases, be different from the medium for distribution. Primary distribution would eventually be broadband broadcast. Primary reception would be cable. For example, rather than downlinking to regional news plants, the offerings of a news or entertainment service would be picked up by a node and sent on to subscribing terminals. These and other offerings would be selectively stored in the individual terminal according to the user program of identifiers.

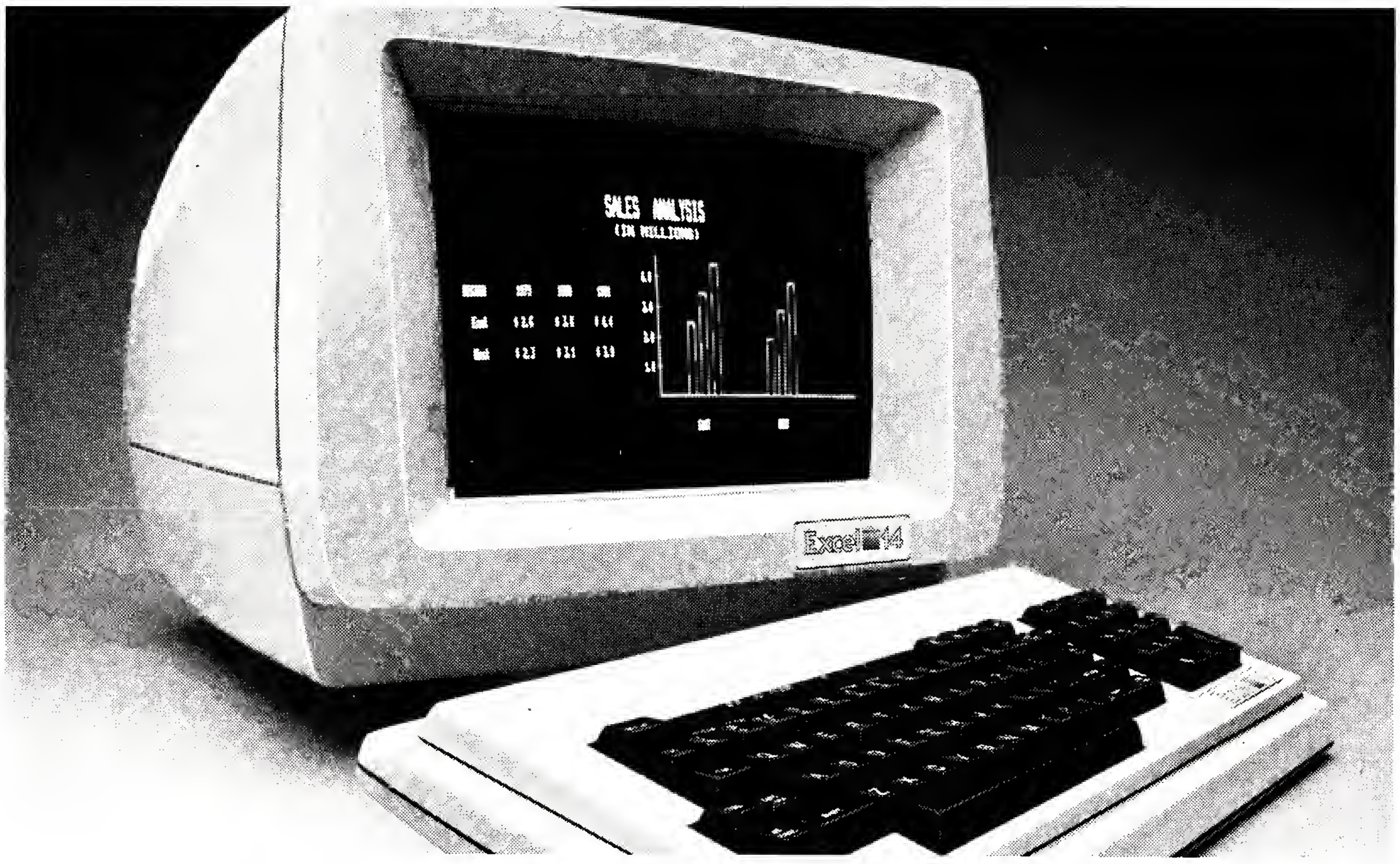
The encryption key would be an essential element, supplying the terminal or personal address. This would allow for a two-key system between sender and address that would supply absolute security when keys were personally exchanged, and a high level of security for communications (including financial) when the key is communicated with message by the sender. This encryption device, along with the special character generator (which would put the terminal in HUC mode), would be the port to a system integrating the new videotex technology, an international index and inexpensive mass density storage. Options for simplified operation, video-disk control, memory and speed can easily be imagined.

This gives only the briefest suggestion of a concept that has been developed since 1967 through various papers and field test (Prestel, 1978). It is a concept that has met only closed doors from those governments that should have the future prosperity and evolution of society at heart. Perhaps the private sector can succeed where bureaucracy and established interests fear to go. One thing is certain: sooner or later such a concept will be in place.

Hilton is an English professor at the University of Georgia in Athens, Ga.



'Oh-oh, That Means I'll Have to Reprogram That One.'



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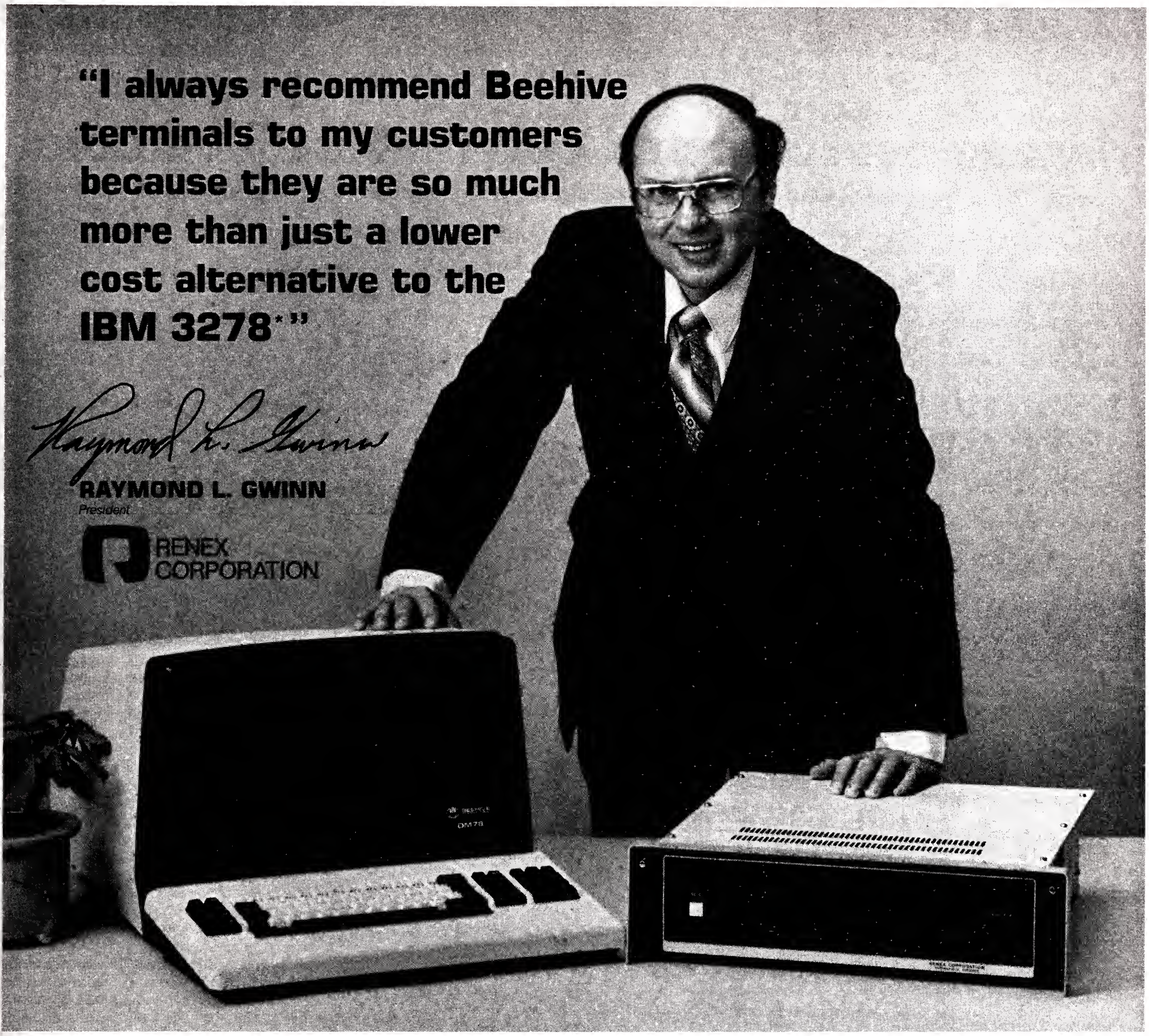
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Cuts Energy Costs, Usage

Management System Cools Fans in Silverdome

Special to CW

PONTIAC, Mich. — The pace of the game determines the heat on the playing field of the Silverdome here, but the warmth of the air is not left to so uncertain a factor.

An energy management system controlled by two Regent 6210 terminals and the Multivision III small business computer from Applied Digital Data Systems, Inc. of Hauppauge, N.Y., cuts energy usage while at the same time maintaining a shirt-sleeve temperature during events.

Interactive System

The interactive system, developed by Kors Instruments and Electronics, Inc. of Cleveland, Ohio, oversees three programmable controllers that control the indoor environment of the Silverdome as well as the pressure fans that provide air to inflate the structure.

Glen Johnson, vice-president and director of engineering for Kors, explained that the Silverdome is able to cut energy costs by such measures as reducing lighting and heating when the stadium is unoccupied and by closely monitoring the heating, ventilating and air conditioning.

"Multivision provides an interface station enabling the Silverdome operator to interact with the system in a supervisory capacity," he said.

"Through the terminals, the system is programmed with start/stop times for heating and cooling on a seven day, reprogrammable cycle based on the time of the event scheduled. The start/stop times are continuously updated based on variables such as external and internal temperatures, wind velocity across the top of the dome and the rate of the temperature change," he added.

Keeps Roof Up

In addition to controlling the environment, the system is responsible for keeping the roof up. Twenty-five pressure fans provide pressure to keep the soft roof inflated.

The pressure is monitored continuously with updates every five seconds on the pressure monitor station. The controls respond automatically to any fluctuations in pressure, maintaining the proper amount needed to regulate the roof.

Dan Newman, operations detailer for the Silverdome, noted that during the periods when large doors are opened for crowds to exit after an event, he or his assistant routinely intervene and control the system manually to prevent any rapid loss of pressure that might occur.

"By overriding the automatic controls, we insure that the fans operate continuously to compensate for pressure that is lost through the large openings," he said. "As soon as the building empties, we put the system back on the automatic control."

Dan Newman, operations detailer, uses the terminal to control the Silverdome's energy management system.

Two terminals in the four-user system are used exclusively for environmental control. One is located in Newman's office where programs are updated and changed as needed.

Status Display

The terminals display the status of any device being controlled — heaters, air conditioning, blowers, exhaust fans, pressure fans, temperatures of the 50 areas being monitored in the structure and even wind velocity across the top of the dome.

In addition, there are fire alarms, burglar alarms at the concession stands and a pressure alarm that overrides other displays.

During any event Newman or his assistant is always present, keeping a close watch on the terminal to note any situation where adjustments may be needed. A second terminal is monitored routinely around the clock in the security office. This station can also be used to start and stop the system and to overrride the fans.

Multivision's use is not limited to the energy management system. "We selected Multivision instead of other small business computers because we wanted a system which would offer multiple capabilities," Newman said. "The two terminals not used for energy management have been modified for use by our secretarial staff for word processing and payroll accounting."

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GETTING COMPUTERS DOWN TO BUSINESS

Especially in Unix Community

Terminal Variety Poses Software Problem

By Matt M. Perez
And Raymond M. Roth
Special to CW‡

The variety and disparity of terminals in today's market makes life very difficult for software developers and end users alike. For end users who want to take advantage of modern software packages that exploit the capabilities of CRT terminals, the problem is one of getting locked into one or, at best, a few terminal choices.

For the software developer, a major portion of its efforts in building a typical commercial package must go into making sure that it can communicate with as many terminals as possible to avoid narrowing the user's choice and to appeal to the widest possible market.

Even after proper design, this remains a maintenance-intensive task throughout the life of the product. Recent developments in Unix-based software point to some good methodologies for creating and maintaining terminal-portable software.

Despite present standards, different terminal models offer a confusing array of options and features. Each terminal speaks and understands a different language or, at least, a different enough dialect. Standards like the well-established 7-bit Ascii and the newer Ansi 3.64 either go disregarded or are quickly bastardized into something else, quite unrecognizable.

There are some ad hoc standards, mostly established by the popularity of certain terminals, but those are not very well respected either. It seems to be up to the software developers to make sure that their products remain compatible with as many terminals as there are.

Nowhere has the need for terminal-portable software been felt more than within the Unix community. The people developing Unix-based software have always been aware of the benefits of software portability. In that context the aim has been to make software portable over many computers. That has been pretty well accomplished since Unix itself has to date been ported over quite a number of 16-bit and 32-bit computers (and even a 20-bit computer). The creation of terminal-portable software is, however, a more recent concern.

Considering Input

In this context portability must be considered in terms of a program's input from and output to a terminal. In terms of a program's output, it is desirable to be able to create programs that can extensively manipulate the terminal's display. This may involve moving the cursor from one place to another, clearing portions of the display or all of it, or calling the user's attention to an area in the display by using reverse video or a high-intensity message.

In terms of its input, a program may allow users to use control keys, function keys or some other special keypads to control the program. It is important to keep the program's behavior and usage the same regardless of terminal brand or model.

Two Unix-based products meet the needs of terminal-portable software developers. Termcap makes the program's output display-independent. Keymap makes the input keyboard-independent and user-extendable.

Termcap is a terminal capabilities data base developed at the University of California at Berkeley. Each terminal in the data base is described in terms of its features or capabilities (for example, direct cursor motion, clear screen and clear to end-of-line). It takes more than 100 capabilities to describe a terminal, though not any one terminal needs all of them. To date, the data base describes more than 150 terminals and is constantly being added to.

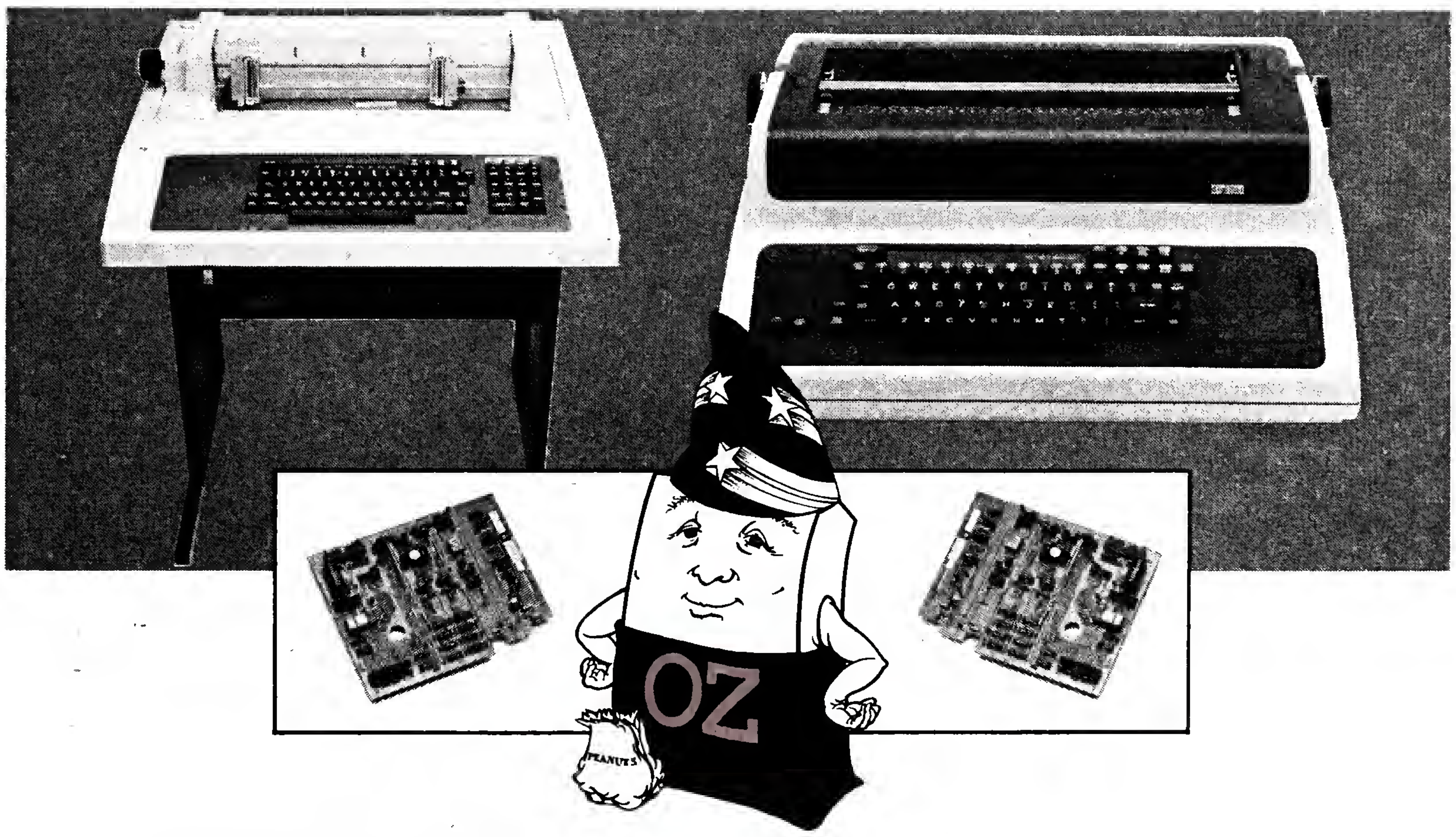
Three Capabilities

There are three types of capabilities used to describe a terminal. Boolean capabilities indicate whether or not a terminal has a particular feature. Numeric capabilities indicate the display's dimensions or the length of a particular delay. String capabilities give a character sequence that can be used to perform particular terminal operations.

Looking over the capabilities used to describe a terminal immediately points out the disparity in features. For example, most terminals accept NUL — the Ascii zero character — as the pad character, which is used to generate delays when necessary; some terminals, however, demand a pad character other than NUL. Most terminals accept Ascii HT (the hori-

(Continued on SR/28)

Can you find the 2 smart elephants in this picture?



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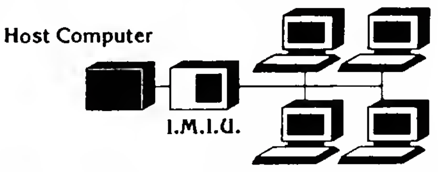

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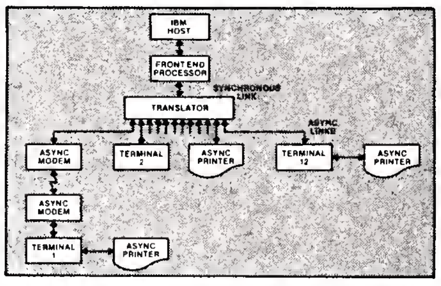

The heart of our system is the Renex TRANSLATOR protocol converting controller. SNA/SDLC and Bisync protocols are supported. No software changes are required, it also features EIA RS-232C interfacing for up to 24 peripheral devices, and supports over 20 different makes of ASCII terminals. Our terminals allow access to both 3270 networks and async time-sharing services. Remote dial-up is simplified with automatic Baud-Rate Detection at speeds up to 19.2 Kbps, plus internal clocking for synchronous interfaces to 9600 bps. Low-cost asynchronous printers may be attached either to the Translator, or directly to the terminal. Printers attached to the terminal may be separately addressed and provide local copy for added flexibility.

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Bart Ross: "In order for us to turn on a dime and get the competitive edge, we need to have orders coming through and going out fast."

Hand-Held Computer Cuts Cosmetics Firm's Order Time

Special to CW

HOLLYWOOD, Calif. — A cosmetics company based here uses a hand-held computer to cut its order cycle time and save money on postage, telephone bills and data entry.

"Being a cosmetics company, we try to turn on a dime," Bart Ross, vice-president of sales administration for Max Factor & Co., said. "In order for us to turn on a dime and get the competitive edge, we need to have orders coming through and going out fast. We found the U.S. mail was sometimes bogged down, and we found that the time lag — from when an order was written until the time it was received back in the stores — was growing rather than shrinking."

Turnaround time was competitive, but that was not good enough. "Under the old system," Hank Troxell, director of management information systems, explained, "the order was dropped in the mail and would go to the order department. The order department would check it to make sure it was filled out correctly.

"Generally, an order that hit the order department at 8 a.m. would be sent to keypunch by noon and the order entry run would begin around eight that evening. So we were probably extremely competitive in terms of turnaround time. The problem was that we would almost always get a carry-over where we simply couldn't get to all the orders in a day."

An interim solution was to have the sales people phone their orders in at the end of the day. But that proved unacceptable when a typical phone call could last two hours or more. Studies showed an electronic order system was the ultimate solution — a system that did not depend on the postal service and that transmitted data over ordinary telephone lines in minutes rather than hours. The company dubbed its new system the Remote Order Entry System (Roes).

Key to Roes System

The key to Roes is the MSI Data Corp. hand-held computer. Small in size, battery-powered and completely portable, the hand-held computer is programmed to accept and store the data normally written on an order form. The sales representative simply uses an optical scanning wand to scan a bar-coded order form and a selection of quantities. At the end of the day the computer connects to a telephone mouthpiece and transmits the order back to the Max Factor DP center here.

"We conducted a test market with department stores on the West Coast," Ross recalled, "and a test with drugstores on the East Coast. We had some skeptics, but the skeptics were soon won over by the sheer success of the program."

The complete order cycle, they found, was reduced by seven to 10 days. In addition, there were hard dollar savings in postage, telephone charges, data entry (keypunch) and the elimination of duplicate orders submitted because of uncertainty over the mail system.

"The cost of handling duplicate shipment returns was always a problem," Troxell noted. With such savings, system payback was extremely fast — less than two years.

But financial savings and the improvement of turnaround time are not the only benefits of the system. "The other thing," Troxell said, "was that we wanted to know right away where we stood in terms of sales. Now, with the system, we know today exactly what we did in regard to performance yesterday." Roes also enables management to track the performance of each individual sales representative daily and to respond to potential problems quickly and effectively.

"We totaled out how much money we'd save and how much time we'd save on turnaround," he added, "but the biggest advantage is one we didn't even think of. Sales people came back and said, 'Now I feel I've got control of things.'

"Before, the sales rep would write an order and drop it in a mailbox. He had no idea when it was going to get to Hollywood . . . And there was always the chance that data entry might keypunch a 44 instead of four,

(Continued on SR/28)

Display Panel Trend

New Technologies Numbering CRT's Days

By Edward L. Papps
Special to CW‡

Where are the CRT and microfiche technologies headed?

The CRT was a marvelous invention. It has served its purpose well and was chiefly responsible for bringing us to the doorstep of the information age of the electronics revolution. But its days are numbered. New technologies are being developed that will make the CRT obsolete.

Don't hold any purchase decisions on these developments because you can expect to replace your current CRT at least once with a new improved model before the new devices evolve to the point where they can be marketed as cost-effective tools. The word of advice is to keep your eye on these trends.

To which trends am I referring? Basically, the new device will be in two parts. One part will be the display. It will be a thin panel you can frame if you wish and hang on the wall. Or better yet, how about mounting it in your desk so when you push a button it rolls up ready for you to use.

Display Technologies

There are two basic technologies evolving in the display arena. One is the liquid-crystal display similar to the one used in many digital watches. The other is what I have heard referred to as a gas-panel display. It involves two pieces of glass that are fused together with a matrix of wires that form the display.

The other part of the current CRT device replacement is the most important. First, take your telephone, calculator, microfiche viewer, clock and any other electronic gadget you may have and throw them out the window along with the CRT. Then, find a part of your desk that is not being used (on top or inside) and add:

- A keyboard for typed data entry.
- A special numeric keyboard for voice dialing and arithmetic functions.
- A phone receiver for private voice communication.
- A speaker and microphone for voice conferencing, dictation or for receiving or sending voice messages.
- Computer boards to provide the power of at least an IBM System/38.
- Operating system software with various other software tools to handle voice, video and data processing and tie all of this in with your display panel and the rest of the network.

'Powerful Desk'

What do you have? One hell-of-a powerful desk! Is this a desk, a micro, a mini, a communications system or a data processing system? I don't know. The answer, of course, is probably yes, but without a doubt the CRT was a good start in the right direction.

A look at the personal camera business is in order. Have you heard about technologies being developed that will make all cameras as we know them obsolete? The new device is no bigger than the camera of today and does not use film but small video disks. Each video disk will store a specific number of pictures for as long as you care to keep them.

At any time you will be able to retake pictures over old ones. They will have a device you plug into your television (same device on which you view movies) that will allow you to see your pictures on television.

What has this got to do with microfiche? Remember the references to voice, video and data processing. Is this a communications environment, a data processing environment, a video processing environment, a distributed environment or a centralized data environment? Maybe it is the service and not the environment you should be concerned about.

Papps may be reached at Words of Wisdom Distribution, 30030 W. 84th St., DeSoto, Kan. 66018.

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Programmable Non-Volatile Function Keys	STD	NO
Video Attributes Require No Display Space	STD	NO
Non Glare Screen	STD	STD
Smooth Scroll, Slow Scroll and Jump Scroll	STD	NO
Audible Key Click	STD	STD
Non Volatile Set-up Modes, "Menu" Style	STD	NO
25 Status Line	STD	STD
Split Screen	STD	STD
Line Drawing Character Set	STD	STD
Block Graphics	STD	NO
Sculptured Keycaps, Matted for Low Glare	STD	NO
Paging	OPT-8 Pgs.	OPT-4 Pgs.
Full Editing	STD	STD
Programmable Non Volatile Columnar Tabbing	STD	NO
Choice of Typomatic/Non Typomatic Keyboard	STD	NO
14" Screen	OPT	NO
Independent Xmit/Receive Rates	OPT	NO
N-Key Rollover	STD	NO
CR New Line Mode	STD	NO
Foreign Character Sets	OPT	NO
User Programmable Non-Volatile Answerback, 32 Codes	STD	NO
Screen Brightness Control from Keyboard	STD	NO
XON/XOFF Flow Control, Split for Xmitter and Receiver	STD	NO

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Terminal Variety Poses Software Problem

(Continued from SR/25)

zontal tab, also known as the control-I) as the tab character; other terminals require something other than Ascii HT.

Cursor motion specification varies widely from terminal to terminal. Many terminals expect the column number followed by the row number; just as many, however, expect the reverse.

One terminal may expect the column and row numbers in binary, another terminal may expect them in binary coded decimal and still others expect them as printable digits.

The Termcap data base makes it possible to create display-independent programs with little maintenance. This data base identifies most, if not all, possible capabilities. By standardizing the name of these capabilities, a program can refer to a capability by its two-letter name.

With more than 150 terminals already described in the data base, a program using Termcap is portable over a wide market. Most likely a new user will need only specify the name of his terminal and the program will find it already in the database. Adding new terminals to the data base is a simple, albeit tedious, job that can be done with any text editor.

Keymap is a keyboard handling front-end package developed by Information Nexus, Ltd. For each type of terminal, a Keymap interface file describes the functionality given the keyboard. Data keys (letters and digits) are standardized and are not the concern of Keymap.

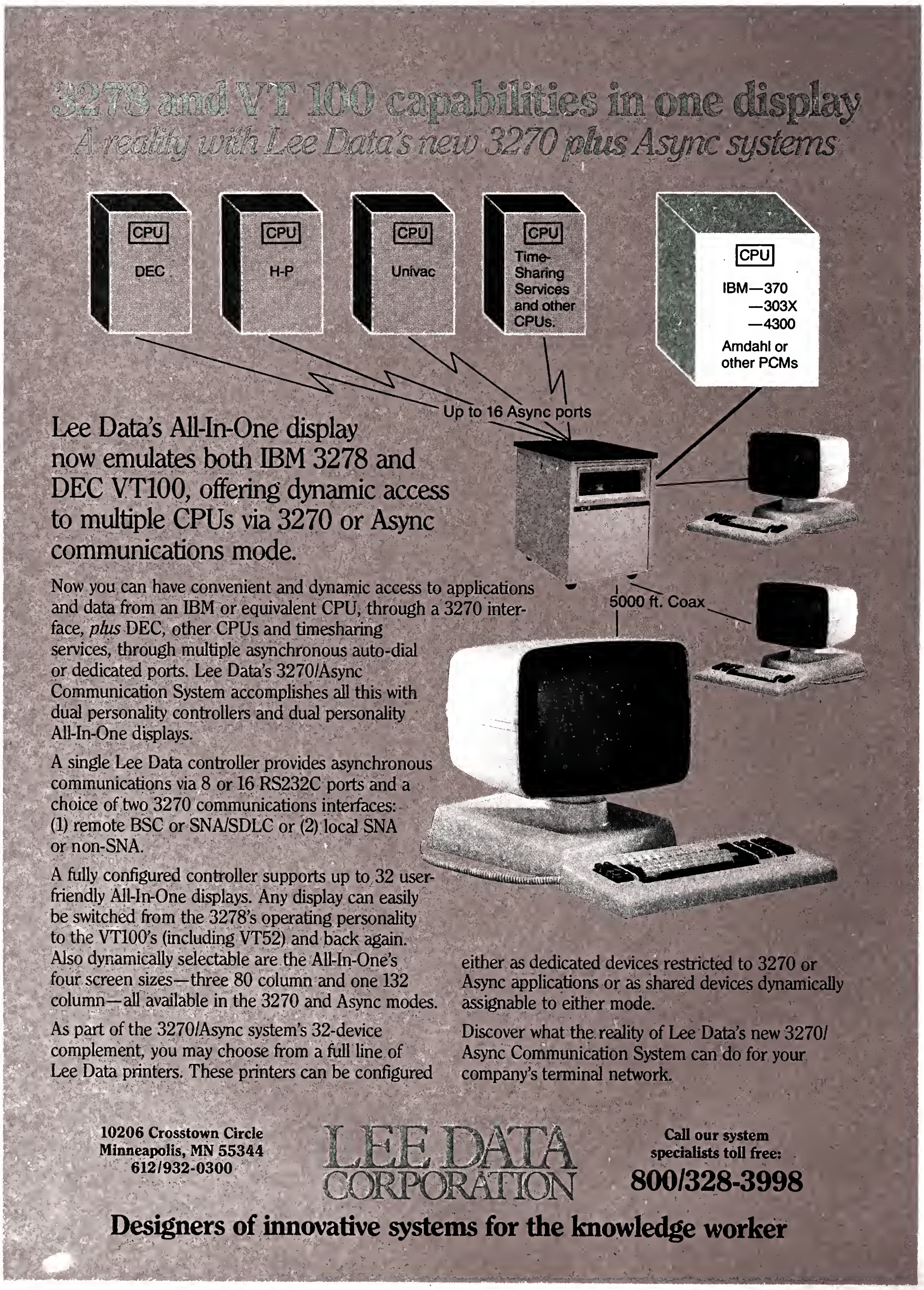
'User-Extendable'

Control keys, function keys and special keypads vary widely from one terminal to the next. A pleasant side benefit of this package is that it makes the user's interface to the program user-extendable.

Rather than a data base, Keymap includes a precompiler, a compiler and a runtime engine. Via the precompiler, the software developer specifies the commands that its program understands. Via the compiler, the user interface is defined — any user can tailor this interface to fit his preferences. The runtime engine interprets input according to these specifications, making the program independent of specific input.

Programs that make intense use of terminals for interacting with users could still gain from more widespread and better supported protocols. For the foreseeable future, a software solution like that offered by Termcap and Keymap seems to be an effective way out.

Perez and Roth are employed at Information Nexus Ltd., Chicago, Ill.



3278 and VT 100 capabilities in one display
A reality with Lee Data's new 3270 plus Async systems

Lee Data's All-In-One display now emulates both IBM 3278 and DEC VT100, offering dynamic access to multiple CPUs via 3270 or Async communications mode.

Now you can have convenient and dynamic access to applications and data from an IBM or equivalent CPU, through a 3270 interface, *plus* DEC, other CPUs and timesharing services, through multiple asynchronous auto-dial or dedicated ports. Lee Data's 3270/Async Communication System accomplishes all this with dual personality controllers and dual personality All-In-One displays.

A single Lee Data controller provides asynchronous communications via 8 or 16 RS232C ports and a choice of two 3270 communications interfaces: (1) remote BSC or SNA/SDLC or (2) local SNA or non-SNA.

A fully configured controller supports up to 32 user-friendly All-In-One displays. Any display can easily be switched from the 3278's operating personality to the VT100's (including VT52) and back again. Also dynamically selectable are the All-In-One's four screen sizes—three 80 column and one 132 column—all available in the 3270 and Async modes.

As part of the 3270/Async system's 32-device complement, you may choose from a full line of Lee Data printers. These printers can be configured either as dedicated devices restricted to 3270 or Async applications or as shared devices dynamically assignable to either mode.

Discover what the reality of Lee Data's new 3270/Async Communication System can do for your company's terminal network.

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Firm Cuts Order Time

(Continued from SR/26)

or forget to keypunch an item altogether. The sales representative had no idea when the order would be processed or shipped.

"Under this system, he can sit there and look a retailer straight in the eye and say, 'I'm going to enter your order tonight, and it'll be shipped tomorrow. Guaranteed.' "

Has this resulted in any increase in sales? "It's hard to say how much of it is directly attributable to Roes," Troxell said, "but we experienced a dramatic increase in orders once we implemented the system."

Why? Greater customer satisfaction is one probable answer, Ross said. "Our major account found that the turnaround time from the time the order was placed until it was delivered was cut by 50% in some cases."

Bank Utilizing Trio of Channels With Automatic Teller Machines

By Thomas W. English
Special to CW‡

COLUMBIA, S.C. — Significant strides are being made in the development of automatic teller machines (ATM) for the banking industry. These changes feature use of primary, secondary and tertiary modem channels for main channel, diagnostic and security data, respectively, used by a South Carolina bank.

South Carolina National operates more than 100 banking offices throughout the state. Its communications network interconnects these offices as well as its Touchmatic ATM stations. From the bank's headquarters and data processing center here, multidrop communication lines extend to main branch bank workflow locations. Each line consists of a 4,800 bit/sec main channel and two 75 bit/sec subchannels.

The main channel interconnects headquarters with teller and back office workstations in each of the eight branches. One of the subchannels carries network diagnostic data, while the other provides security. The ATMs are linked to each of these latter communications paths. Main channel ATM data is transmitted on a separate system.

Channel Capability

This unusual utilization of primary, secondary and tertiary channels results from the capability of the Racal-Milgo, Inc. MPS 4800 modem to provide two slow-speed channels as well as one high-speed main channel.

In the case of South Carolina National, the main channel data is transmitted within a bandwidth of 1,200- to 2,400 Hz, centered at 1,800 Hz, while the diagnostic channel is centered at 420 Hz and the security channel at 3,180 Hz. The total band extends from 300- to 3,300 Hz (see box).

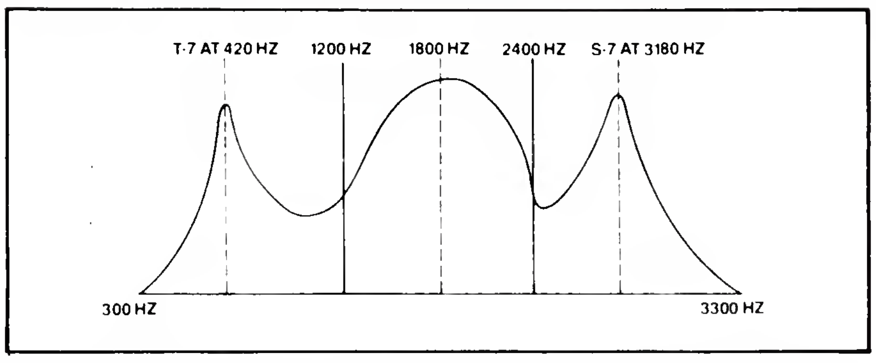
Any attempted or accidental neutralization of the 3,180 Hz frequency would be interpreted at the bank's headquarters security alarm console. The location would be immediately determined and corrective measures taken.

Each ATM, whether installed through a wall at the branch banking office or in a nearby kiosk, contains alarm sensors that interface with an alarm remote unit. The remote unit transmits to the main branch workflow areas remote MPS4801 modems on the S-7 security channel, and the data proceeds from this point to the bank's headquarters alarm console.

The console is a minicomputer with floppy disk storage that provides a great deal of data for both the branch banking offices and the remote ATMs. It operates half-duplex but can still poll each site having S-7 alarm or other security sensors.

Prior to the Racal-Milgo trifunction modem installation, the bank relied on a two-wire telephone circuit running to a law enforcement agency. If the alarm was acti-

(Continued on SR/30)



Main channel data runs at 4,800 bit/sec on a bandwidth of 1,200- to 2,400 Hz centered at 1,800 Hz on the total 300- to 3,300 Hz bandwidth. Security data runs at 3,180 Hz; any deliberate or accidental neutralization of the frequency could be interpreted as an alarm. Diagnostic data runs at 420 Hz.

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BABYMUX is as fast as any multiplexer in its class. Asynchronous lines transmit data up to 9,600 bps; synchronous lines transmit data up to 19,200 bps. And best of all, those speeds are a BABYMUX standard feature.

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No competing multiplexer gives you more operating information or control than BABYMUX. Its front panel displays multiplexer status, buffer activity, transmission errors, line selection, and lighted bar graphs that continuously show percentage of line utilization.

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South Carolina Bank Using Three Modem Channels

(Continued from SR/29)

vated, the agency would not know whether it was due to a short in the phone line or to an intruder.

The present mini-driven alarm console can pinpoint the existence of a problem, the nature of the problem and its location, instantly.

Most alarms are physically activated, but the capability for voice-activated alarm sensors is now a very real one. For example, if an intruder entered a bank manager's office, or if there was a sudden illness or injury of an employee, the bank manager could physically activate an alarm or vocally trigger the alarm by speaking a given word, phrase or other code in a normal tone of voice.

Through a nearby sensor, South Carolina National's Security Department, an appropriate law enforcement agency or both, would be notified instantly of the nature and location of the problem. In many cases the time required for remedial response would be a matter of seconds.

The most frequent alarm situations at South Carolina National are environmental alarms, open door alarms and so forth. Included in the bank's network are alarms for intrusion, unauthorized vault door openings or attempts to open, bank facade tampering, ATM access door and chassis tampering.

Another valuable feature of the bank's data communications system is the Racal-Milgo Communications Management Series (CMS) System 1000 network diagnostic controller's ability to monitor the integrity of the phone lines. Through T-7, the second of the network's two subchannels, this diagnostic system continually monitors the operation of all the related components — modems, terminals and lines, as well as the System 180 itself.

While a malfunction is being corrected, the System 180 notifies the central control operator to activate the appropriate alternate connector devices in order to continue data transmission.

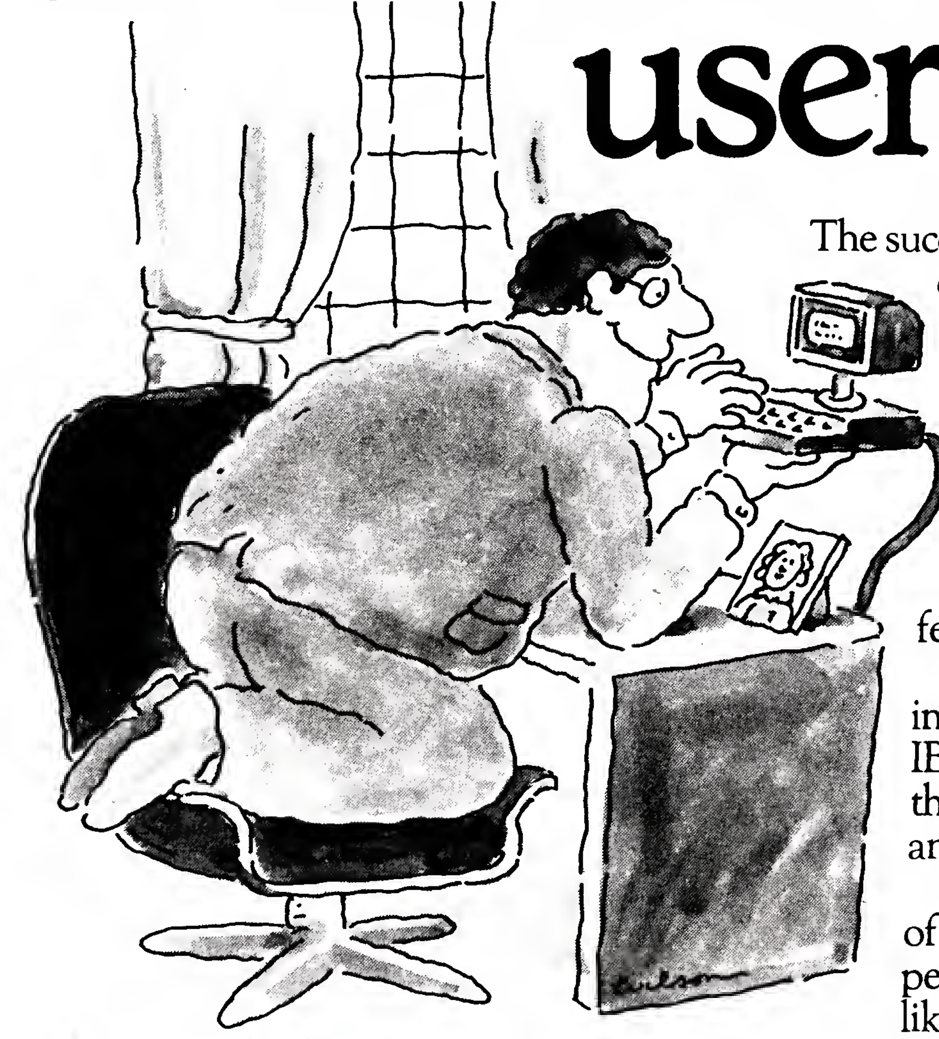
The CMS 1000 can provide monitor and control capabilities for South Carolina National's ATM and branch banking system networks simultaneously. It also permits monitoring of all transmission lines at the same time, rather than in sequence. The diagnostic capabilities of the System 180 include self-test, end-to-end test, line loop, DTE loop and error test. An automatic fault reporting subsystem provides alarms for modem power failures, streaming, receive line failure, dedicated line not restricted and can trigger external, customer-provided alarms.

The system became configured as it is because two years ago, during the bank's ATM vendor evaluations, the Security Department also was evaluating modems and other devices for possible T-7 piggybacking capabilities.

Diebold, Inc.'s ATMs and Racal-Milgo's modems and diagnostic system met the criteria and permitted expanded capabilities. At the time, Diebold and Racal-Milgo entered a cooperative marketing plan in which their respective banking applications would be combined to provide financial institutions opportunities to reduce costs by line-sharing financial and security data. This technique foregoes the need for banks and other financial institutions to run duplicate lines to ATMs and other data processing termination points.

English is a data communications officer at the South Carolina National Bank, Columbia, S.C.

Very small terminals for IBM users.



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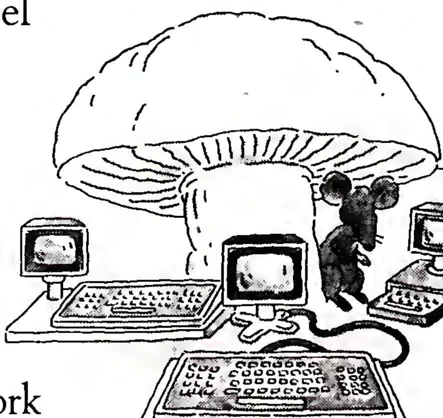

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Building Firm Closes Distance Between Offices With Terminals

Special to CW

ATLANTA — Computers are playing an ever increasing role in helping a construction company with district offices in six cities get its work done.

HCB Contractors is the second largest building construction company in the U.S. With district offices here and in Baltimore, Chicago, Dallas, Houston and Los Angeles, HCB constructs high-rise office buildings, shopping centers, hospitals and light commercial construction. More than 400 salaried employees plus about 6,000 job-site employees are currently involved in almost a billion dollars' worth of construction projects for the company.

The company's Project Control Information Systems (PCIS) group, headed by Ed Faulkner, has spent the last six years determining needs and uses for data processing, defining solutions and helping get them implemented.

One recent PCIS project involved the movement of data between HCB's local offices, field sites and an IBM 4331 mainframe in Dallas.

"Depending on the tasks," Faulkner explained, "we were using one of two procedures: filling in paper forms, which were mailed in for service bureau batch processing, or accessing the mainframe directly from the field. The first approach was slow and inefficient; the second was not sufficiently cost-effective in the long run."

Company Considerations

What HCB needed was a way of putting data together at job sites, verifying it and getting it to the central system while concurrently receiving other data and reports. This translated to a list of technical requirements for each site, including 3270 and 3780 protocols, storage and processing power, autoanswer and unattended transmission capability.

In addition, there were human concerns. "Our people in the field include construction engineers, field office managers, superintendents and project managers," Faulkner explained.

"They're not programmers and they shouldn't have to learn to be. We needed a process which would be easy to use — press a button, select from a menu and enter data. No JCL, no programming — the whole point was to make the work easier, not more complicated."

Cost also was a major consideration. "We were spending $500 each month per site just for 3270-type facilities, including dial-up capability and printer. We set that price as a target in selecting the alternative system — we weren't sure that it was possible," Faulkner said.

After an extensive study of available systems, HCB selected the Codex Corp. Model 68/44 intelligent terminal because it "met our immedi-

(Continued on SR/37)

THE ANN ARBOR AMBASSADOR™ 300

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Contractor Closes Distance Between Offices

(Continued from SR/35)

ate specifications, including support of the right communications protocols and also supported Cobol, which didn't need excessive memory," Faulkner explained.

"The potential for system upgrade and expansion matched our long-term growth plans, and the price was actually a few dollars under our budget target. Also, the Codex Corp. system was able to run communications as a separate task, with no performance degradation because a completely separate circuit board handled the task."

Currently, more than 25 complete Codex systems are in use at HCB district offices and field job sites. "We proved the system's worth with the first application," Faulkner reported. "Our old methods took up more time in the field and on our mainframe. This new way is faster, easier and more economical."

Ready for Transmission

HCB's first PCIS system employing the Codex 68/40s generated verified data files ready for transmission. "This is where the advantages of our new data communications setup began to show," Faulkner said. "By simply transmitting an existing file, instead of keying data online, we eliminated about 90% of the phone time involved. By using data compression and expansion routines furnished by Codex we were able to reduce the time further.

"Finally, the autoanswer and unattended transmission features on the Codex let us program our mainframe to call and transmit data at night, when phone rates are lowest."

Faulkner's group has begun developing additional uses for the Codex system now that the data file application has shown the benefits that can be achieved. "Of major benefit," he explained, "will be the Proposal/Change Order System."

Proposal/change orders relate to the changes that contractor and client suggest as a construction project advances. All such proposals must be kept track of and checked against current plans for possible conflicts, such as air conditioning ducts occupying the same space as piping. Approvals must be entered into the current plans and specs for scheduling and costing. Status of all this must be available at both the site and the home office.

Besides facilitating the flow of data from HCB offices and job sites to the host IBM mainframe, the 68/40's data communications capability allows sites to receive various types of data, such as reports, updated data base files and messages. Being able to send this information at opportune times "cuts our costs and increases reliability," Faulkner said.

"In addition, we can download software directly over the phone lines. That's important to us. With 25 systems in the field, all using the same software, we can't be dependent on sending updates through the mail on floppy disks. We initiate changes in Dallas, send the new programs over the lines and know that by morning all job sites will have the new program changes. Overnight and accurate, that's what it's all about."

Besides doing local stand-alone processing and 3780 RJE communications, the 68/40s provide 3270 emulation. This allows HCB personnel to communicate on-line with the central site 4331 and query the corporate data base.

"For the cost of our old dial-up facilities, we're now able to give all our sites substantially more resources, in a more convenient manner and with far less related cost," Faulkner summarized.

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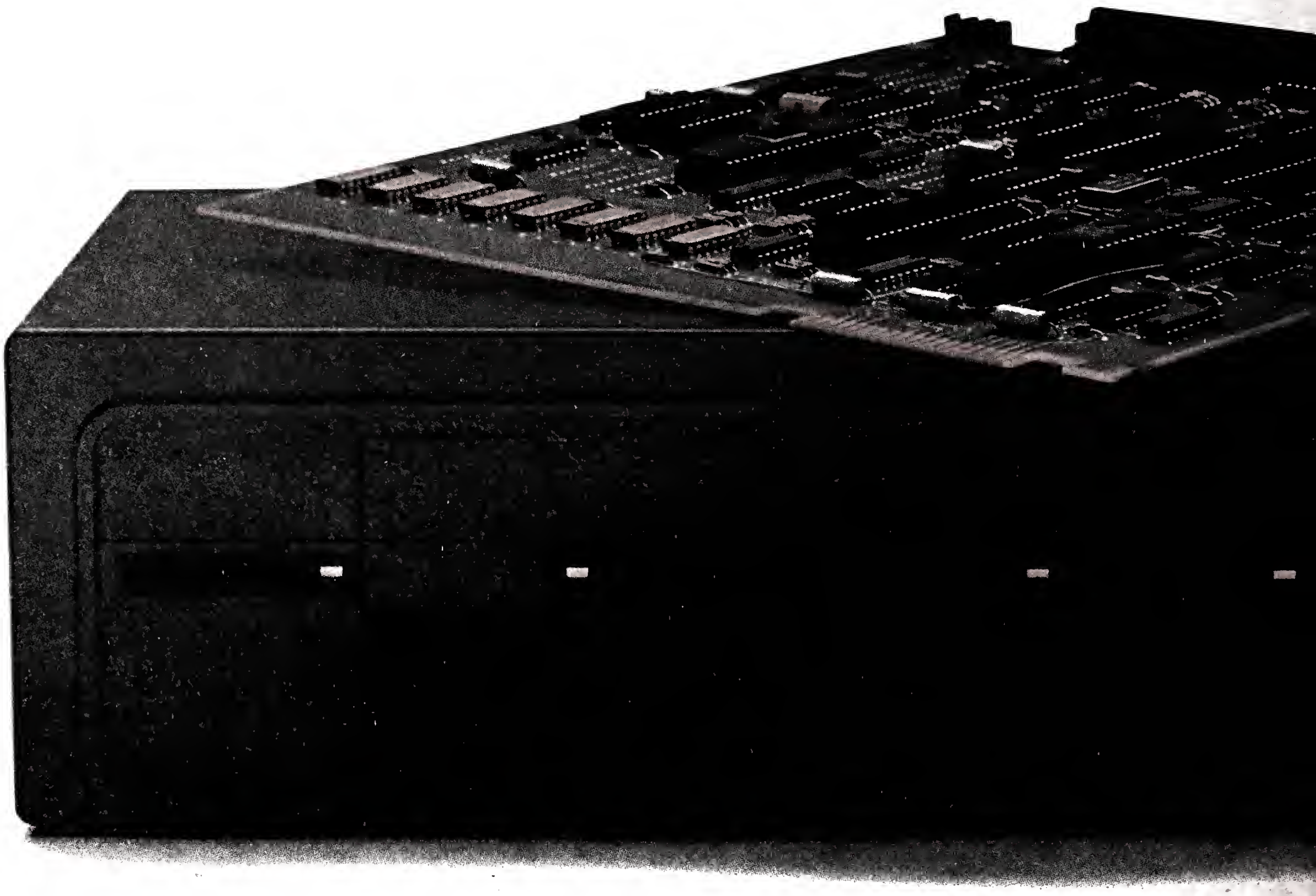
Here's everything you need to make your VT100 a CP/M personal computer.



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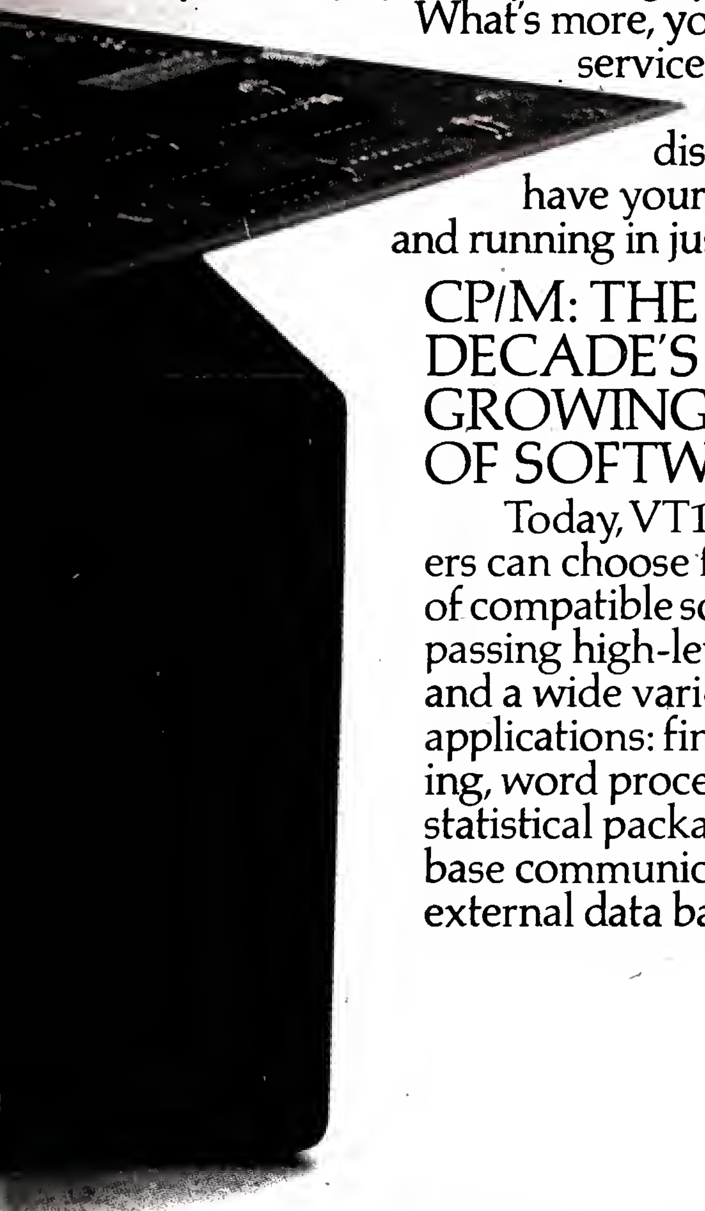

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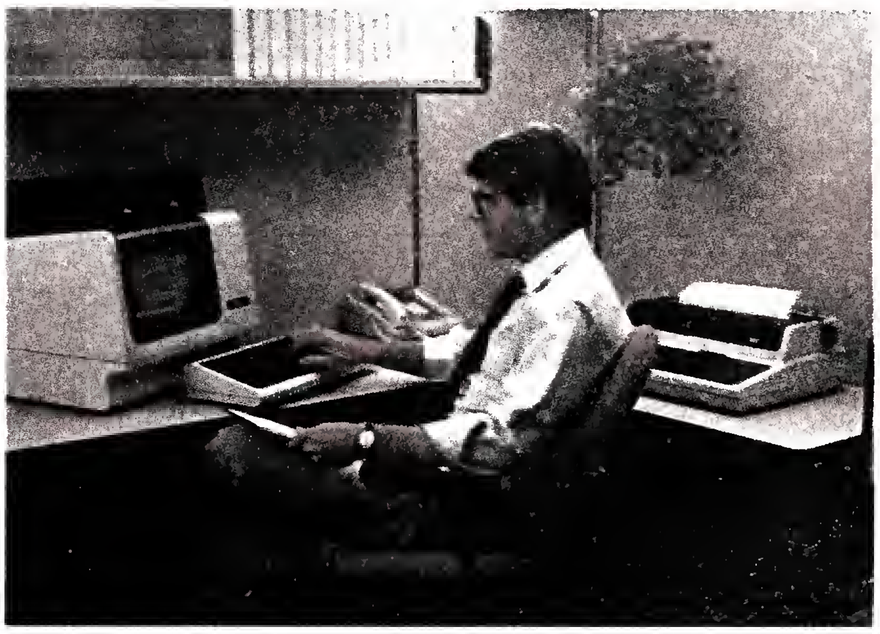

Digital's personal office computing option comes with a Z80-based CPU, dual mini floppy drive standard (second dual floppy drive optional), diagnostic disk, user documentation and guide, and installation hardware.

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Touch-Sensitive Units Trim Fat Off Restaurant's Steak Division

By Ruth Cox
Special to CW‡

DENVER — A division of a restaurant chain with corporate headquarters here has installed a touch-sensitive computerized system that greatly increases the accuracy and speed of its order taking process, the chain said.

The Quality Steak division of Mr. Steak, Inc. receives orders for meats and restaurant supplies from store managers in 200 franchised restaurants and 60 directly owned restaurants across the country. Last August the DP department installed a touch-sensitive, computerized sales order entry system. More than 500 orders are processed weekly.

The system is comprised of four Radio Shack TRS-80 Model II microcomputers, fitted with a touch-sensitive CRT add-on option, designed and manufactured by Interaction Systems, Inc. The four TRS-80s operate as stand-alone computers and communicate to the company's Digital Equipment Corp. 2060 mainframe.

The touch-sensitive CRT add-on option, called the TK-100 Series, has been created to simplify the interaction between people and machine-readable information stored in a computer. The TK-100 consists of a touch-sensitive faceplate and an electronic touch control board. After it has been added to a video display terminal in a computing system, data in the system can be accessed when the user touches, with a fingertip, information that is displayed on the CRT screen.

The touch-sensitive feature can be used in conjunction with, or in place of, a keyboard. The TRS-80 has a detachable keybaord. In Mr. Steak's system, the keyboard is used in conjunction with the touch screen at certain points during a transaction.

Paul Case, Mr. Steak's vice-president of management information services, stated, "The touch-sensitive CRT add-on option provides one of the cleanest user interfaces I have ever seen. We looked at voice recognition, light-pen technology and X-Y digitizers. None of these are as accurate or as easy to use as this touch-sensitive product. I wanted to keep our sales people acting as sales people on their jobs. I didn't want to introduce a data processing system that would force them to become data entry operators."

The main menu offers the sales service representative access to the entire order entry system. The six data catagories in main menu are process orders, enter terminal mode, statistics inquiry, inventory inquiry, display untransmitted orders and end.

When the sales service representative touches process order, the system responds by taking the user further into the order processing menus in the system. When the enter terminal mode is touched, the TRS-80 Model II simulates a terminal that can "talk" to and run any systems that reside on the DEC 2060 mainframe.

Mr. Steak employees input sales orders on touch-sensitive CRT screen.

The system displays the number of items in stock and which of Mr. Steak's three warehouses is holding the items. When display untransmitted orders is touched, the system responds by listing store numbers and order numbers on the video screen that have not been transmitted by the sales service representative to the main computing system.

At this point, a user can check his work to be certain orders are transmitted to the main computing system before leaving the office at the end of the day.

If process orders is touched in main menu, the system displays the second menu level of the order processing. This menu, entitled process orders menu, displays five data categories. The five categories are order entry/maintenance, review list of orders for a store, add a line to be transmitted order, transmit order and end. If order entry/maintenance is touched, the system takes the user further into the order processing procedure and displays another menu from which to work.

Largest Menu

To actually enter an order into the system, the sales service representative touches order entry/maintenance on the process orders menu. When this data category is touched, the system responds by displayng the third main menu entitled order entry/maintenance menu.

This is the largest menu in the system and when it is used it invokes a balanced use of touch and keyboard entry procedures on the part of the user. The seven data categories in this menu are setup orders/add header information, add lines — custom screen, add lines — category screen, add lines — manual entry, review/delete sales order, change store/orders and exit.

When setup orders is touched, the system displays an actual order format and the user is prompted to key in pertinent header information pertaining to the order. The prompts are listed on the video display of the TRS-80.

The user keys in the information requested by the prompts. When the second, third and fourth data categories are touched, the user can add detailed changes to an order. If "review/delete sales order" is touched, the system displays an edit opportunity for the user. Five data categories are displayed in the edit mode: change header information, review line information, add miscellaneous information, add comment lines and exit.

The user can change the content of an order by using this very detailed edit mode. The sixth data category in the order entry menu is change/store orders and when this selection is touched the system displays the most recent order keyed into the system. Corrections can be made on the order by retouching the screen.

In the Quality Steak division, the touch-sensitive computerized system has been well received. The touch system is reportedly 100% more reliable than the manual method formerly used and other methods tested.

From the DP department's viewpoint, the touch-sensitive microprocessor-based order system contains all the elements necessary to create a satisfied user. First, users have a friendly interaction medium that allows them to remain sales people and not become typists. Second, since one microprocessor system is dedicated to each user, response time and system behavior is consistent.

Third, the sales people are directly responsible for input to the computer system.

Cox is public relations manager with Mr. Steak in Denver.

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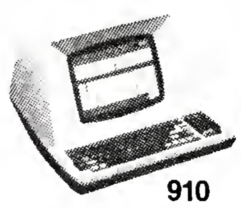
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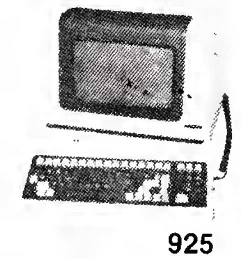
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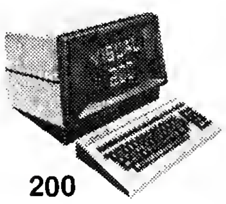
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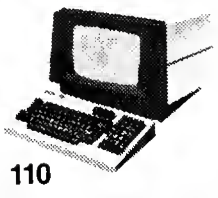
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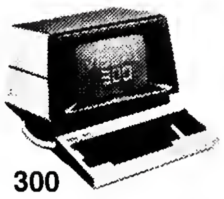
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300/1200 Baud Integral Modem	Opt	Opt	Opt	No	No	No
Detached Keyboard	No	Yes	Yes	Yes	Yes	Yes
N-Key Rollover	No	No	No	Yes	Yes	Yes
Function Keys	10	11	11	12	13	12
Programable	No	No	Yes	Yes	Opt	No
Non-Volatile	No	No	No	Yes	No	Yes
14" Screen	No	No	No	Opt	Opt	Opt
Screen Saver	No	Yes	No	Yes	No	Yes
132 Character Line	No	No	No	No	No	Yes
Status Line	No	Yes	Yes	Yes	No	Yes
Smooth Scroll	No	No	Yes	Yes	Yes	Yes
Line Drawing Set	No	No	Yes	Yes	Yes	Yes
Block Graphics	No	No	No	Yes	No	No
Tektronix Graphics	Opt	Opt	Opt	No	No	No
Foreign Character Sets	Yes	Yes	No	Yes	No	No
Block Mode	No	Yes	Yes	Yes	Opt	No
Set-Up Mode	No	Semi	Semi	Yes	No	Yes
Additional Pages Memory	No	1	3	7	No	No
Printer Port	Yes	Yes	Yes	Opt	Yes	Opt
Bi-Directional	No	Yes	Yes	Yes	No	Yes
Buffered	No	Yes	Yes	Yes	No	Yes
Emulations:						
ANS11 X3.64	No	No	No	Yes	No	Yes
Hazeltine	Yes	No	No	No	Yes	No
Lear Siegler	Yes	No	No	No	Yes	No
Adds	Yes	No	No	No	Yes	No
Tektronix 4010	Opt	Opt	Opt	No	No	No
DEC VT.52	No	No	No	No	Yes	No
Data General	No	No	No	No	No	Yes

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Data Entry System Protects Insurer's Collateral

By Saundra R. Shockley
Special to CW‡

INDIANAPOLIS, Ind. — A supplier of collateral protection insurance here improved customer relations by purchasing a data entry system.

National Underwriters, Inc. works with bank, credit union and finance company lenders. Its application software monitors the presence or absence of borrower-supplied loss payable insurance, and in its absence notifies the borrower of his obligation to the lender. The system then ultimately supplies a collateral protection insurance policy protecting the lender's interest in the collateral.

Originally, application software was created to supply a simple, straightforward, batch input approach. Input was keypunched and verified by an outside service on IBM-129 equipment. It was then collected and processed (for each individual lender) once a week.

Original System

Two major problems associated with the original batch input approach were:

- Input was received from many people in many different lenders' offices, then keypunched by an outside service totally unfamiliar with the nature or content of correct data, thus producing a tremendous number of rejected or incorrect entries.
- Batched input and packaged output required several days in transit to and from the lender. This, combined with once-a-week processing, meant that a single entry might require one week to input, one week to process and one week to return to the lender, which was an unacceptable amount of time. The system caused delay and error and was at the mercy of mail and other delivery services.

Because of the above situations, a valid loss payable often required so much time for acceptance that notices were sent to the borrower or collateral protection insurance policies were issued that by all rights should not have been created. This created turmoil between the lender and its customers and often resulted in operational difficulties between National and the lender.

Eliminating First Problem

After a short period of time, a major step was taken to eliminate the first problem. In 1977 National purchased a Pertec Computer Corp. XL-40 Intelligent Data Entry System and hired a staff of data entry operators.

The advantages realized by this move were twofold. First, the data entry staff was given preliminary training that provided them with an education necessary to determine, in many cases, whether input was of an acceptable nature.

Secondly, the XL-40 system with its intelligent, programmable capabilities allowed many preliminary editing functions to occur at the time input was entered, thus creating far more accurate input at the mainframe point.

Ultimately, input rejects as a result of editing at the mainframe were reduced by approximately 95%. This percentage made the investment and endurance of problems associated with initially getting the XL-40 programs off the ground worth the time, dollars and effort spent.

The ability to prompt information on a screen for the data entry operator, and the ability to perform editing functions within the XL-40 memory, proved to reduce mainframe rejects to the usual types such as loan number not on file and loans paid off.

Although the screen size on the XL-40 keystation was limited to basically 360 characters, the ability to prompt the operator was a tremendous advancement over entering information blind as required by conventional keypunch equipment. These enhancements, however, did not relieve time constraints imposed by data collection techniques and delivery schedules.

Double Duty

About this same time, Pertec announced XL-40 host interactivity capabilities. Simultaneously, the need for more updated data, and in a more timely manner, was becoming an absolute necessity. Additional hard copy was out of the question since an overwhelming volume of hard copy had been imposing a storage and retrieval problem for some time. Microfiche solved a part of this problem, but still did not supply a solution to timeliness of updated information.

The solution was to use the XL-40 system as an inquiry medium in addition to using it as a data entry device. Another stumbling block prevented this, because the initial system design did not allow direct access into data files. Therefore, there was a delay in the ability to access data for inquiry or any other direct purpose until application software was redesigned in such a way that files were available to CICS and direct access software.

The decision was made to totally redesign the applica-

(Continued on SR/44)

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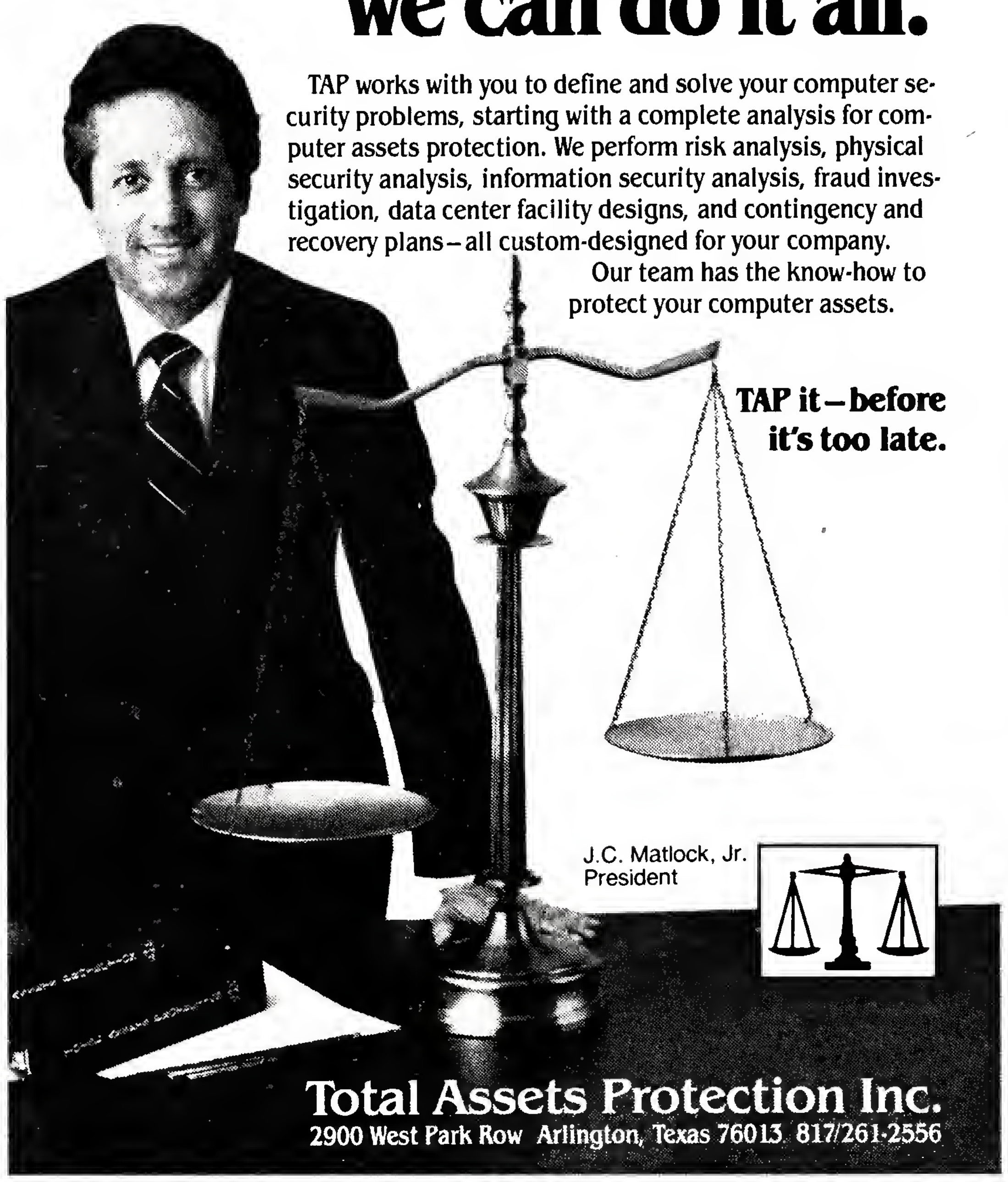
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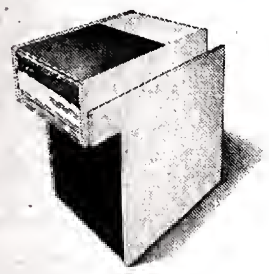
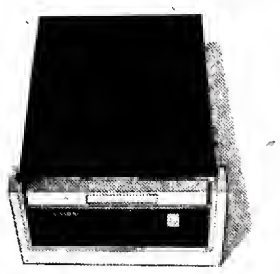
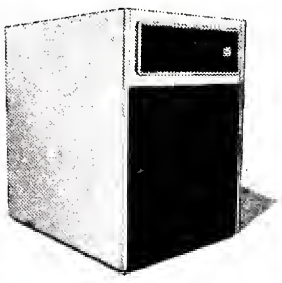
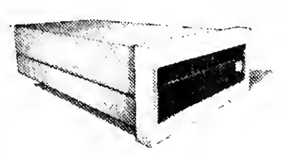
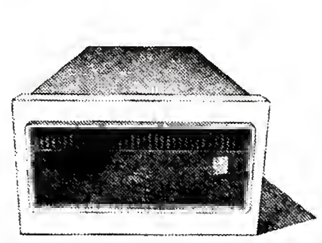
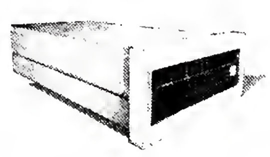

For LSI-11/23 Q-Bus: 80 MB Removable Emulates DEC RM02/03

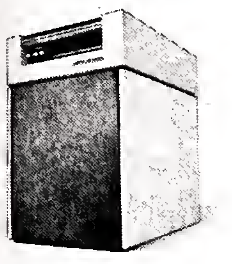

For LSI-11/23 Q-Bus: 64 MB Fixed/Removable Emulates DEC RK06/07

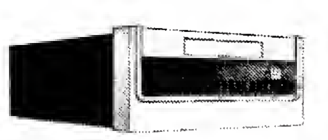

For PDP-11/04-60 UNIBUS: 675 MB Fixed Emulates Two DEC RM05s


For PDP-11/70 CACHE BUS: 80 MB Fixed Emulates DEC RM03

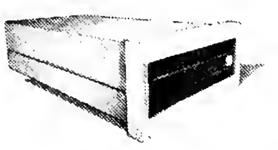

For VAX UNIBUS: 160 MB Fixed Emulates DEC RM03 Expanded

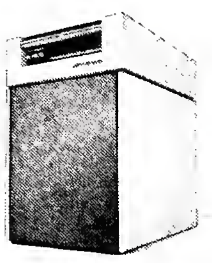

For VAX-11/750 CMI: 80 MB Removable Emulates DEC RM03

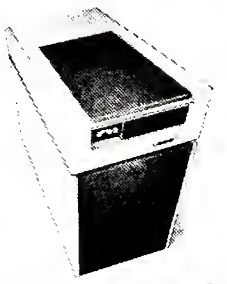

For LSI-11/23 Q-Bus: 300 MB Removable Emulates DEC RM05

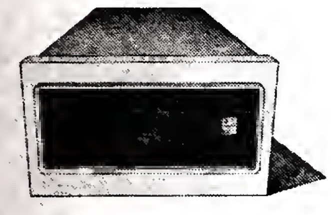

For LSI-11/23 Q-Bus: 96 MB Fixed/Removable Emulates DEC RK06/07

For PDP-11/04-60 UNIBUS: 32 MB Fixed/Removable Emulates DEC RK06/07

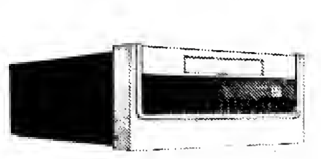

For PDP-11/70 CACHE BUS: 160 MB Fixed Emulates Two DEC RM03s

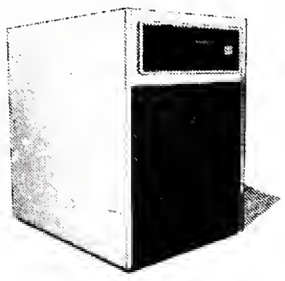

For VAX UNIBUS: 675 MB Fixed Emulates DEC RM05 Expanded

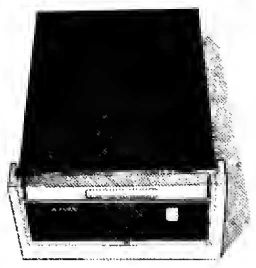

For VAX-11/750 CMI: 300 MB Removable Emulates DEC RM05

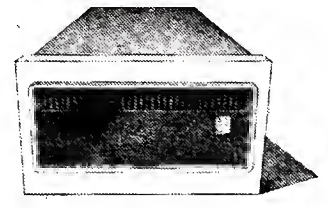

For LSI-11/23 Q-Bus: 80 MB Fixed Emulates DEC RM03

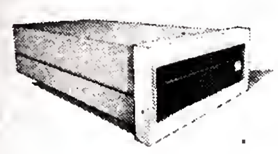
For PDP-11/04-60 UNIBUS: 80 MB Removable Emulates DEC RM02/03


For PDP-11/04-60 UNIBUS: 64 MB Fixed/Removable Emulates DEC RK06/07

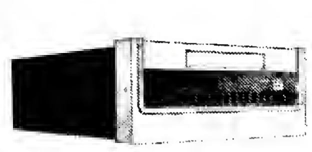

For PDP-11/70 CACHE BUS: 675 MB Fixed Emulates Two DEC RM05s

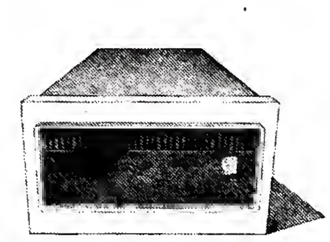

For VAX UNIBUS: 32 MB Fixed/Removable Emulates DEC RK07


For VAX-11/750 CMI: 80 MB Fixed Emulates DEC RM03

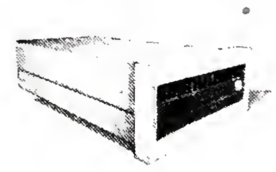

For LSI-11/23 Q-Bus: 160 MB Fixed Emulates Two DEC RM03s

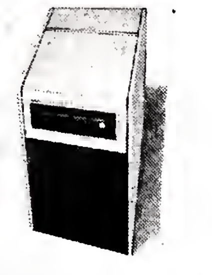
For PDP-11/04-60 UNIBUS: 300 MB Removable Emulates DEC RM05

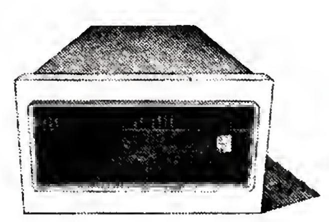

For PDP-11/04-60 UNIBUS: 96 MB Fixed/Removable Emulates DEC RK06/07

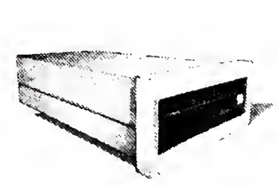

For VAX UNIBUS: 80 MB Removable Emulates DEC RM03

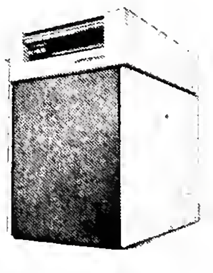
For VAX UNIBUS: 64 MB Fixed/Removable Emulates DEC RK07


For VAX-11/750 CMI: 160 MB Fixed Emulates DEC RM80 or Two RM03s

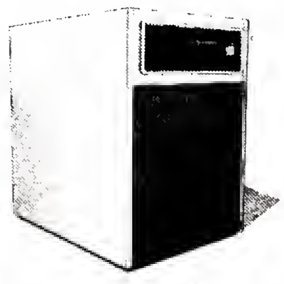

For LSI-11/23 Q-Bus: 675 MB Fixed Emulates Two DEC RM05s

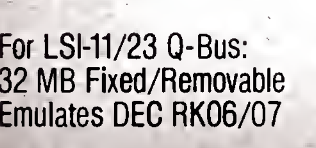

For PDP-11/04-60 UNIBUS: 80 MB Fixed Emulates DEC RM03

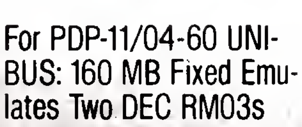

For PDP-11/70 CACHE BUS: 80 MB Removable Emulates DEC RM03


For VAX UNIBUS: 300 MB Removable Emulates DEC RM05

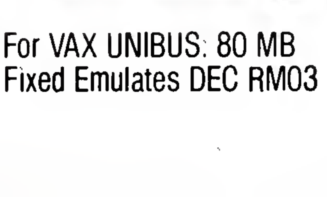
For VAX UNIBUS: 96 MB Fixed/Removable Emulates DEC RK07


For VAX-11/750 CMI: 675 MB Fixed Emulates Two DEC RM05s


For LSI-11/23 Q-Bus: 32 MB Fixed/Removable Emulates DEC RK06/07


For PDP-11/04-60 UNIBUS: 160 MB Fixed Emulates Two DEC RM03s

For PDP-11/70 CACHE BUS: 300 MB Removable Emulates DEC RM05


For VAX UNIBUS: 80 MB Fixed Emulates DEC RM03

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Data Entry System Protects Insurer's Collateral

(Continued from SR/42)

tion software using Vsam and a user-defined alternate key link to all primary files.

Inquiry via the XL-40 did allow more access to information within the files than had ever been realized before. This seemingly sufficient solution was very short lived. The continued demand for additional information soon outgrew the limited number of character positions available in the XL-40 screen.

Contention imposed upon the XL-40 by the extremely high volume of concurrent data entry and inquiry functions caused exceeding memory and/or disk capacity to become an almost daily occurrence.

Scheduling Solved

The second of the two major problems that had to be dealt with was the fact that input was collected at the mainframe and processing for a lender only occurred on a weekly basis. This schedule is perfectly acceptable for the smaller lender, but for a large lender it does not provide a resolution to procedures that have become cumbersome due to high volumes of activity.

Procedures in-house were streamlined in every way possible to attempt to alleviate the problem. However, streamlining of procedures in the lender's office or in National's operations center could not satisfactorily lessen the restrictions imposed by these two problems. The remaining solution was to input transactions from their point of origin rather than from the National office here in Indianapolis.

Presently, National is in the process of implementing a communications network that will reach into its remote operation centers and into certain individual lenders' offices.

One of the most carefully coordinated factors in application software upgrades has been to make any and all revisions and changes as nearly transparent to the user as possible.

The current upgrade to a full-blown on-line transaction update system will be the most significant that National's users have seen since the package was initially implemented.

Future Goals

Along with finalizing the solution to two very real problems, application software now in the process of implementation has been developed with a much more optimistic future in mind. Provisions are being made whereby various types of terminals will be an integral part of a fully automated office environment.

Numerous capabilities and advantages to an on-line terminal system will allow National a responsive and innovative approach to meeting the needs of its customers regardless of their geographic location.

At the same time, solutions to communications enhancements both in-house and with remote locations are being incorporated in such a way as to share resources without being obvious or detrimental to the on-line remote center.

Originally it was targeted that within three years National's customers and volumes would reach five or six states and monitor 150,000 loans. In five years, the system monitored that number many times over in 26 states.

Without terminals and their many capabilities and flexibilities, accommodating this growth would not have been possible and satisfying otherwise insurmountable problems could never have been resolved.

Shockley is vice-president, data processing, National Underwriters, Inc., Indianapolis, Ind.

"ICCI'S Communications Processor saved us enough money to offer automation to twice as many agents."
Deetsy Armstrong/Mgr. Distributed Systems/SAFECO.

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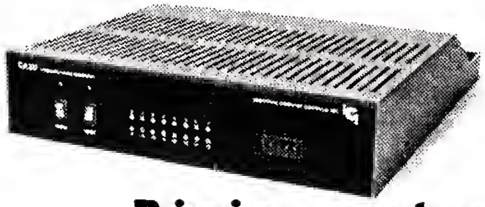
"The cost of other solutions would've made our nation-wide network growth difficult. But now, instead of using a leased line to each agent, we use one CA20 Communications Processor for 8 agents, so that accessing data entails only a local phone call. This allows us to offer our program to more agents. And we expect to expand throughout the U.S. and Canada, thanks to the savings we enjoy with the CA20."

For more information on the cost-effective, easy to install CA20 Communications Processor, send for our free brochure or phone 617-864-0283. TELEX: 95-1106.



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Automates Process

County Gets Handle on Its Data Collection

By George J. Kohut,
Allen Hathaway
And Deborah Whitt
Special to CW‡

FAIRFAX, Va. — For several years, Fairfax County worked on automating its land-development process. Facing a data collection problem, the county studied alternatives and chose hand-held computer input devices as its solution.

The land development process begins with the submission of a rezoning application and is completed with the issuance of an occupancy permit. This automation effort is comprised of three large, linked, on-line computer systems — the Rezoning Application System, the Plan and Agreement Monitoring System and the Inspection Services Information System — each of which automates a particular phase of the development process.

In 1979, with work proceeding on both the completion of the Plan and Agreement Monitoring System and the design of the Inspection Services Information Systems, a data collection problem was encountered in the area of capturing construction inspection results and related data in a timely manner.

Experience in implementing the Plan and Agreement Monitoring System showed that some of the benefits such as immediate access and better information were offset by the need for additional staff to input the data to the computer.

Staff Unchanged

With this in mind, county staff identified hand-held computer input devices as a possible means for solving the data collection problem without adding positions to input the data to the computer. These devices would be used to capture site inspection data required for the Plan and Agreement Monitoring System as well as trade inspection data required for the Inspection Services Information System. County staff requested that the fiscal year 1982 budget include funding for a possible pilot project to test these new devices and began a one-year comprehensive study of the problem and viable solutions.

During this year-long study, the county identified five different options available for resolving the data collection problem. These options included keypunching, optical scanning, CRT terminals, telephone with audio response and hand-held computer terminals. The driving forces in the selection of the best option were identified as the amount of inspection data needs to be captured and the time in which the inspection results must be made generally available.

During the summer of 1980 inspection functions and data requirements were identified. Both current and long-range data needs were considered at this time. With the completion of the study, county staff recommended the hand-held computer input device as the only viable option available for capturing the necessary inspection data. In December 1980, it was recommended that the pilot project be implemented as proposed.

Hand-held computer input devices are small (approximately 8 in. by 3.5 in. by 2.5 in. and weighing less than two pounds), solid-state, battery-powered devices that look very similar to electronic calculators. They are capa-

(Continued on SR/46)

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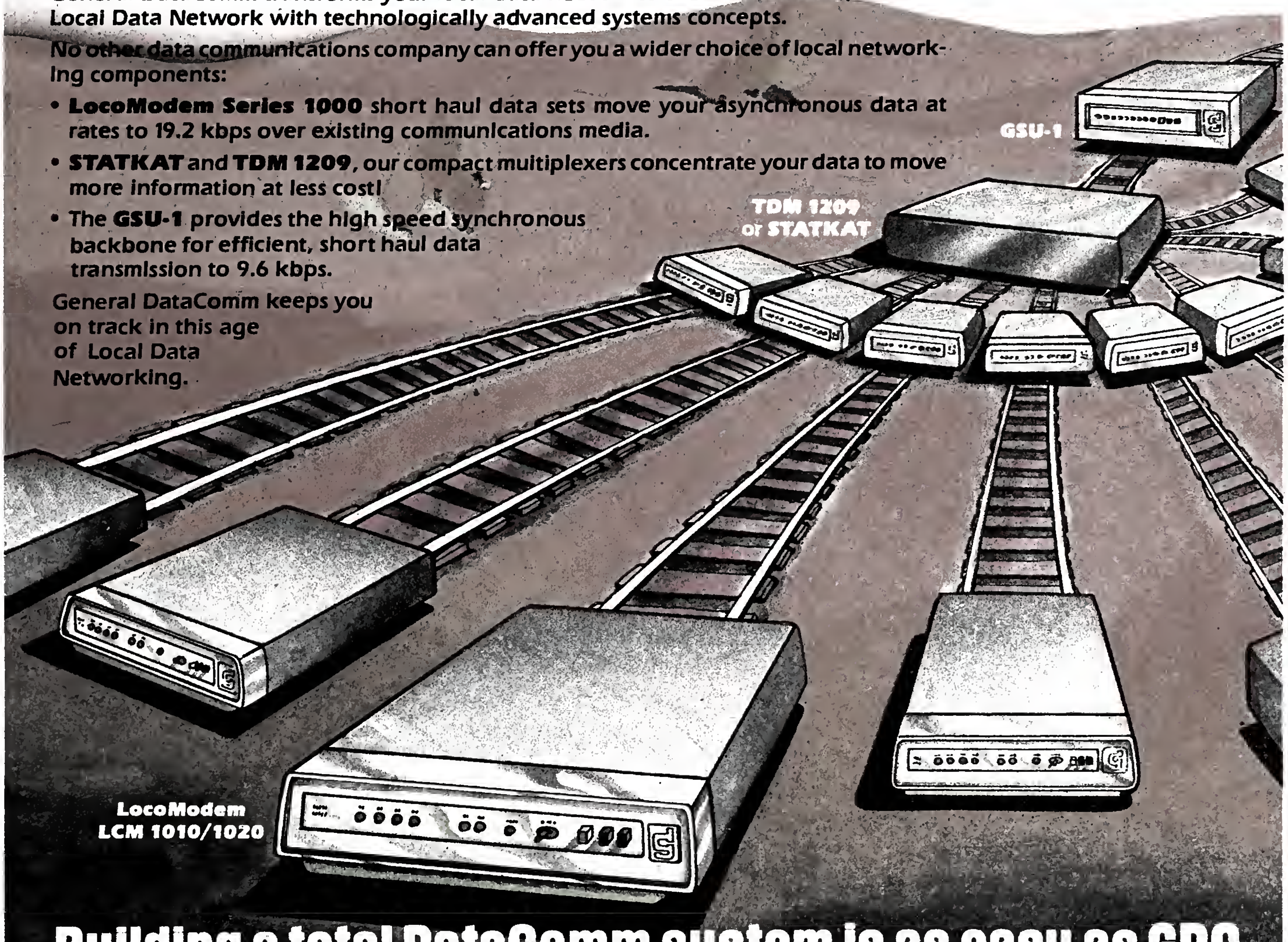

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County Gets Handle on Its Data Collection,

(Continued from SR/45)

ble of recording and storing up to 64,000 characters of data and can be programmed to prompt the user for a response, to edit the response and to accept only valid responses. Data stored in the device may be retrieved, displayed and modified as necessary.

The devices generally have a full alphanumeric keyboard and a display area large enough to display 16 characters at a time. Data may be transferred over common telephone lines to a receiving unit at the central computer site where it may be processed as required. The devices will retain data in memory even though the power is switched off and will provide an indication of battery failure.

The present inspection process in Fairfax County is a manual process consisting of receiving inspection requests, assigning inspectors to perform the inspections, performing the requested inspections and collecting and posting the inspection results. Inherent in the inspection process are several problems that need to be addressed:

- Inspectors responding to requests for inspections that cannot be performed.
- Limited availability of inspection results for several business days after the day the inspection was performed.
- Unavailability of previous inspection history and inspector's notes for inspectors working outside their normally assigned areas.
- Transaction errors related to the receiving and posting of inspection data in central records.

Although different options can address some of these problems, only the hand-held computer input device option can address all of them.

Proposed Use

It was proposed that each construction inspector would have his own hand-held computer input device for recording inspection results during the normal course of the inspection.

Also, the hand-held input devices were to be programmed to prompt the inspector to respond positively that specific details of the inspection were performed and that the work was approved. For example, in a building footing inspection, the hand-held input device will ask the inspector to respond that he checked for proper alignment, proper reinforcing bars, proper pier footings and so forth.

At least once per workday each inspector will transmit the stored inspection data over common telephone lines to a receiving unit at the central computer site. All such data will be processed overnight and posted to the appropriate computer files so that the detailed inspection data is available for review at any CRT terminal the next business day.

This detailed inspection history data also will be printed for the inspector the next time a request for a later inspection is made for work authorized on the same permit.

Because hand-held computer input devices are relatively new and are expected to operate in a harsh field environment, it was decided to perform a pilot study of these devices before making a commitment to the full-scale project. The pilot program checked the following areas of concern:

- The ability of input devices to withstand harsh field environments.
- Inspector acceptance.
- Data capture capabilities.
- Programming capabilities of input devices.

Hand-held computer input devices will provide Fairfax County with improved capabilities to manage, operate

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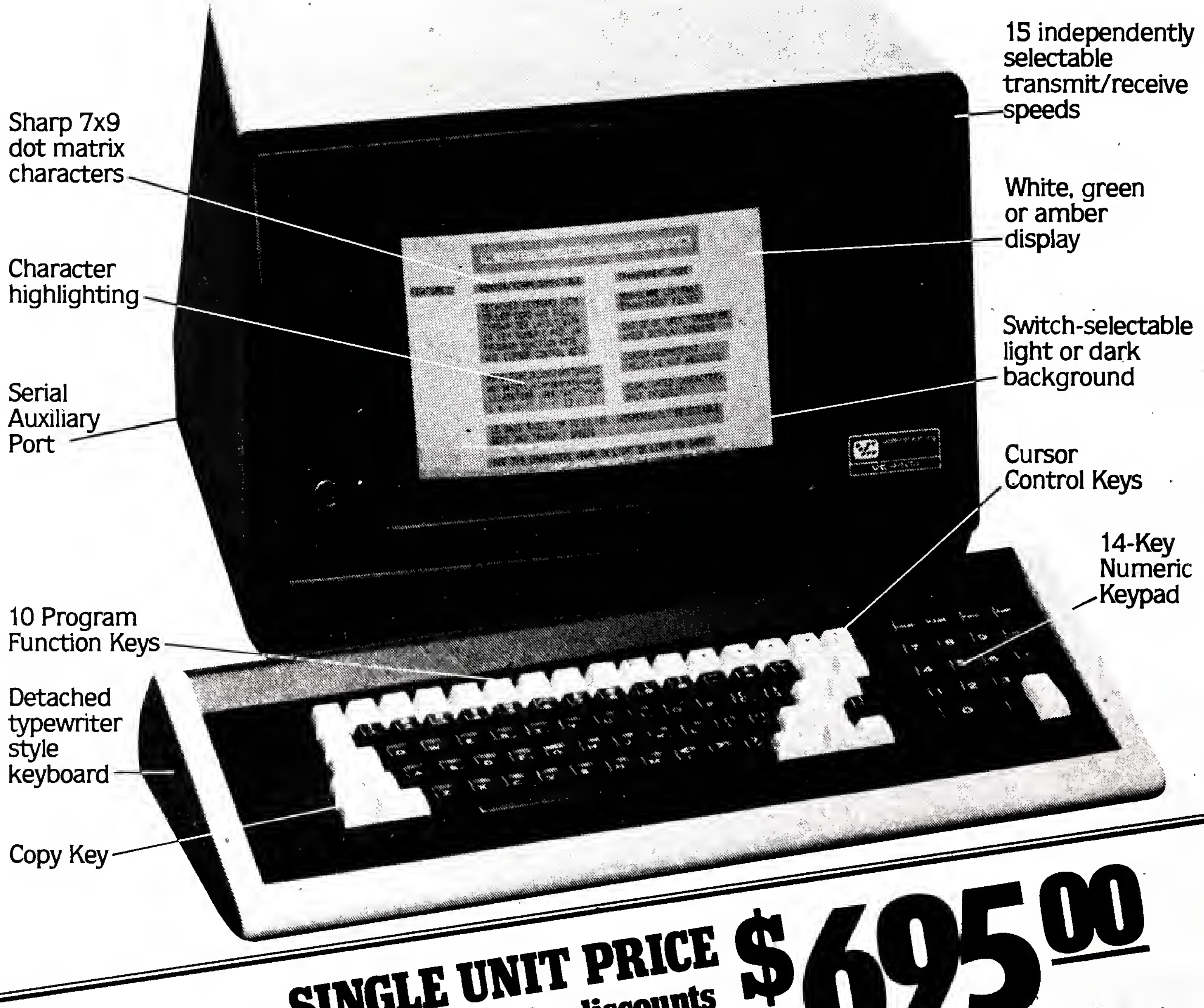
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Converts to Hand-Held Terminal System

and control tasks associated with the construction inspection process and provide management personnel the opportunity to reassign people from the processing of paper involved in this process to duties in other important processes.

An improved capability to manage will result from the more rapid recording and retrieval of inspector field reports. The inspectors' reports are the basis for monitoring construction and supervising personnel and providing management responses to members of the Board of Supervisors, other jurisdictions, agencies of the commonwealth, Fairfax County residents and developers and contractors. The electronic retrieval of inspectors' reports places field data quickly in the hands of managers in a usable form.

The improved integrity and volume of data will more readily support the information requirements of the management staff to plan for the organization and to train personnel. Additional support will accrue to the annual process of fiscal planning and fee schedule review.

The rapid retrieval of inspection data will assure county managers of the best available data in legal matters related to code administration. Computer-collated field data will enhance both intradepartmental coordination and coordination with other county agencies.

As a result, better utilization of staff can be expected with the allocation of county resources providing more meaningful support to the county program of management by objectives. Furthermore, additional functions have been incorporated into the Permit Application Center, which is being implemented concurrently to provide better service to the public.

The utilization of the hand-held terminal input devices will allow any capacity gained from conversion to the electronic records system to provide staff for a telephone information center needed to upgrade the services for county clientele.

An improved capability to operate will result from an increased ability to communicate field data to clients. Presently, contractors, developers, concerned citizens, staff members and state officials request field reports the day following the inspection. However, county staff is unable to meet these requests. The hand-held computer input device project will enable the staff to provide such timely and complete information.

The hand-held computer input devices will reduce the amount of effort involved in processing Residential Use Permits (RUP) and non-RUPs. The electronic recording of inspection reports significantly reduces the administrative burden of inspectors. Time savings are expected to net one-half hour each day per trade inspector.

An improved capability to control will result from the standardized field data that the hand-held computer input device will record. Built into the inspector's input device will be sequential inspection lists to be followed in recording the inspection results.

In addition, times, deficiencies, violations and much more information will be recorded. The inspection lists will ensure more standardized inspections throughout the county, a better accounting of inspectors' time and more consistent enforcement efforts.

Kohut is chief of the assessments and land use branch at the Office of Research and Statistics. Hathaway and Whitt are senior programmer and systems analyst, respectively, in the Fairfax County government, Fairfax, Va.

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By Jean Bartik
Special to CW‡

COMPANY	NETWORK	NETWORK TYPE: Baseband / Broadband	ACCESS METHOD: Contention / Token Passing / Other	TRANSMISSION SPEED: to 1M bps / to 2M bps / to 10M bps / over 10M bps	CABLE LENGTH: to 2000 ft / to 5000 ft / over 5000 ft	GATEWAYS: IBM SNA/SDLC / X.25 / Xerox Ethernet / Other	APPLICATION AREA: General Business / Electronic Mail / Word Processing / Industrial / Other
A.B. Dick	the Loop	● —	— ● —	● — — —	— ● —	— — — —	● ● ● — —
Amdax	Cablenet	— ●	— — ●	— — ● ●	— — ●	● — — ●	● ● ● ● ●
Apollo	Domain	● —	— ● —	— — — ●	— ● —	● ● — —	● — ● ● ●
Convergent Technologies	LRS	● —	— — ●	— ● — —	● — —	● ● — —	● — ● — ●
Corvus Systems	Omninet	● —	● — —	● — — —	— ● —	● — — —	— — — — ●
Data General	XODIAC NBS	● —	— ● —	— ● — —	— ● —	● ● — —	— ● ● — ●
Datapoint	ARC	● —	— — ●	— — ● —	● ● ●	● — — —	● ● ● ● ●
Digital Equipment	DECdataway	● —	— — ●	● — — —	— — ●	— — — ●	— — — ● —
Electrosound Systems	DLX-10	● —	● — ●	● — — —	— ● —	— — — —	— ● — ● ●
Electrosound Systems	DLX-320	● —	● — ●	● — — —	— ● —	— — — —	— ● — ● ●
Gould	Modicon Modbus	● —	— — ●	● — — —	— — ●	— — — ●	— — — ● ●
Gould	Modicon Modway	● —	● ● —	— ● — —	— — ●	— ● — —	— — — ● ●
Hewlett-Packard	Interface Bus	● —	— — ●	— — ● —	● ● —	— — — ●	— — — ● ●
IBM/NAD	8100	● —	— — ●	● — — —	● — —	● ● — —	● ● ● — —
IBM/NMP	Series/1 Ring	● —	● — —	— ● — —	— ● —	● — — —	● — — — —
Intecom	InteNet	● —	— — ●	● — — —	— — ●	● — ● ●	● ● ● — —
Interactive Systems/3M	VIDEODATA	— ●	— — ●	● — — —	— — ●	— — — ●	— — ● ● ●
Logica	Polynet	● —	— ● —	— — ● —	● — ●	● — — ●	● ● ● ● ●
Molecular Computer	INFINET I	● —	● — —	● — — —	● — —	— — — —	● — ● — —
Molecular Computer	INFINET II	● —	● — —	● — — —	● — —	— — — —	● — ● — —
Network Systems	HYPERchannel	● —	● — —	— — — ●	— ● —	— — — ●	● — — ● ●
Nestar	Cluster/One	● —	● — ●	● — — —	● — —	● — — ●	● ● ● — ●
Novell Data Systems	Novell 2000	● —	— — ●	● — — —	— ● —	— — — ●	● — ● — ●
Ohio Scientific	IBS-NET	● —	— — ●	● — — —	● ● —	— — ● ●	● ● ● — —
Prime Computer	Ringnet	● —	— ● —	— — ● —	● — —	● — — —	● ● ● ● ●
Sperry Univac	SHINPADS	● —	— — ●	— — ● —	● — —	— — — ●	— — — — ●
Standard Engineering	Microlink	● —	— ● ●	● — — —	— — ●	— ● — —	● ● — — ●
Stratus Computer	StrataLINK	● —	— ● —	● ● — —	● — —	● ● — —	● — ● ● ●
Syntek	MARS/NET	● —	● — —	● — — —	— ● —	● — — —	● — ● ● —
Sytek	LocalNet	— ●	● — ●	● ● — —	— — ●	● — — —	● — — ● ●
Teletype	4540 Local Connect	● —	● — —	— ● — —	● ● —	— — — —	● — — — ●
Three Rivers	Packet-Stream	— —	● — —	— — ● —	— — ●	— ● ● —	— ● — — ●
3COM	UNET	● —	● — —	● — — —	— — ●	— — ● ●	● ● — — ●
Ungermann-Bass	NET/ONE Baseband	● —	● — —	— — ● —	— ● —	— — ● ●	● — ● ● ●
Ungermann-Bass	NET/ONE Broadband	— ●	● — —	— — ● —	— — ●	— — ● ●	● — ● ● ●
Wang Labs	Wangnet	— ●	— — ●	— — — ●	— — ●	— — — ●	● — ● ● —
Xerox	Ethernet	● —	● — —	— — ● —	● — ●	● — ● ●	● ● ● — —
Zeda	InfiNet	● —	● — —	● — — —	— — ●	— — — —	● — — — ●
Zilog	Z-Net	● —	● — —	● — — —	— — ●	● — — —	● ● ● — —
Ztel	Axis	● —	— — ●	● — ● —	— — ●	— ● — —	● — — — —

Data Decisions, Inc. Chart

Local-Area Network Vendors

Local-area networks are growing rapidly in number as well as variety, but most systems available today do not include application-level software allowing different makes of terminal devices to communicate with each other.

Application-level software for local-area networks is available; but with one exception, it interconnects only an individual vendor's terminals. The exception is Network Systems Corp.'s Network Executive (Netex) software, which supports host-to-host communications via the company's Hyperchannel bus.

Users who want to interconnect their own computers, peripherals and workstations can choose from among seven vendors listed on the accompanying table. Each interfaces with multiple vendors' devices, but only at the message transport level, not at the application level.

Network Systems is one of the seven. It provides a standardized communications-level interface to IBM, Digital Equipment Corp., Control Data Corp., Amdahl Corp., Burroughs Corp., Cray Research, Inc. and Honeywell, Inc. mainframes and peripherals. Electrasound Systems' DLX local-area network is also totally transparent to system hardware and software below the application level. The others in this group are Ungermann-Bass, Inc.; Sytek, Inc.; Amdax Corp.; Interactive Sytems/3M, Inc.; and Ztel, Inc.

Best Known Network

Ethernet is probably the best-known local-area network. It is a joint development of DEC, Intel Corp. and Xerox Corp. But only Xerox currently offers a product based on Ethernet — the Xerox 8000 Network System. Other companies such as Interlan, Inc. connect DEC PDP-11 and VAX-11 computers to Ethernet. DEC currently offers no Ethernet products on its own, although the company has said it intends to offer them.

The Ungermann-Bass Net/One baseband network is Ethernet-compatible, as is Three Rivers Computer Corp.'s Packet Stream Network. Two other vendors — Ohio Scientific, Inc. and Intecom, Inc. — provide Ethernet gateways.

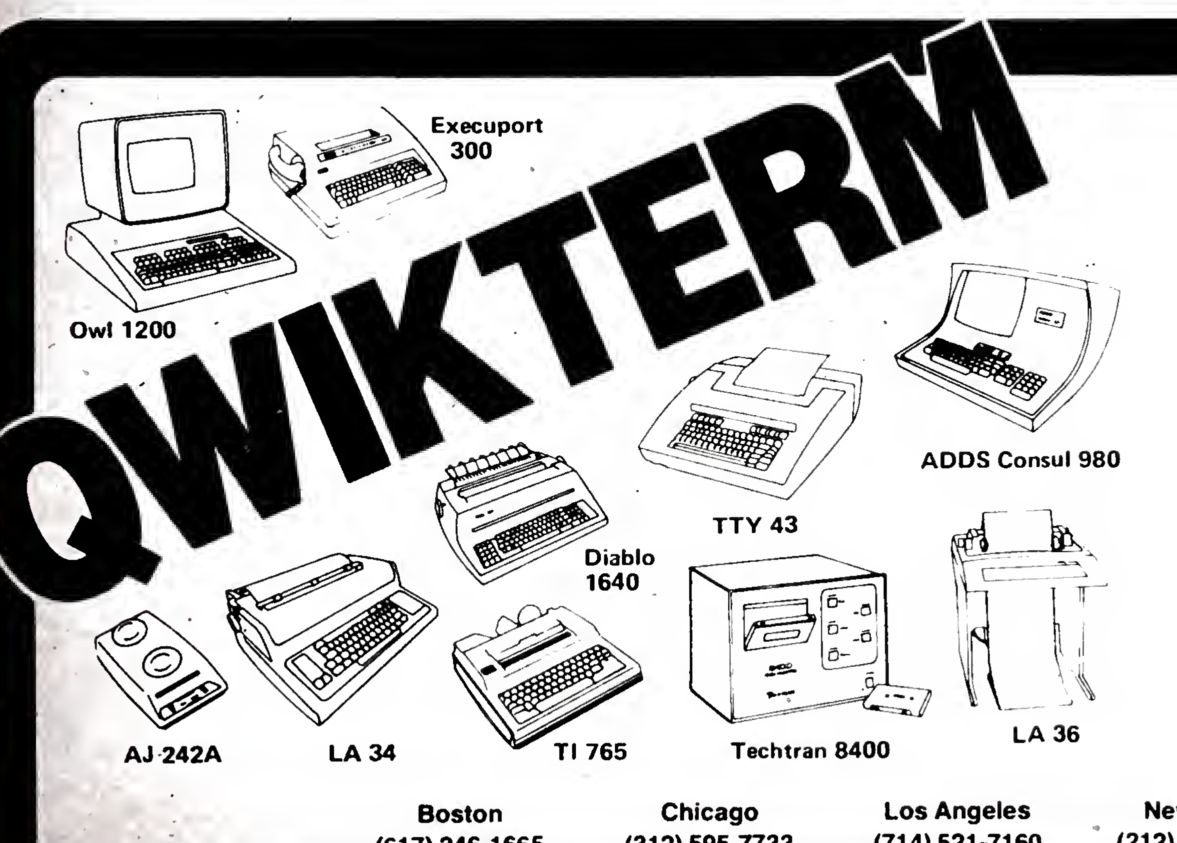
Products for Unet

3Com Corp. offers products to implement Unet, a complete Ethernet local-area network based on DEC computers and the Unix operating system. Unet off-the-shelf hardware and software products include a transceiver, controller and communications control software.

Each of the networks mentioned so far was designed to accommodate several different applications. Another group of local-area network products is more specialized, however.

Office automation has become one of the most popular applications areas for these latter systems, while distributed processing is another. A few local nets are used primarily for industrial applications and a growing number are being developed to interconnect microprocessors.

(Continued on Page 42)



- LA 36 – DECwriter II $595. plus options
- TI 765 – Bubble memory $1700.
- Perkins Elmer Owl 1200 – CRT $995.
- Techtran 8400 – Cassette Recorder $250.
- AJ 242A – Acoustic Coupler $150.
- ADDS Consul 980 – CRT $495.
- Execuport 300 – Portable $495.
- Diablo 1640 or 1650 – Like new $2295.
- LA 34 DA $695. – LA 34 AA $795.
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Point-to-Point, Packet-Switching

Dynatech Offers Three Network Products

ALEXANDRIA, Va. — Dynatech Packet Technology, Inc. has announced three network product families said to address themselves to applications from single point-to-point applications to packet-switching networks.

The DP-1000 point-to-point multiplexers reportedly are available in four- and eight-port versions and feature flow control, autospeed, autoparity, compression, local echo, error-free transmission and full break support. The four-port version costs $1,195, and the eight-port version costs $1,995.

The Multi-Plex.25 and the Multi-Switch.25 packet switcher were designed for users who need more than point-to-point applications. Using combinations of the two, the user reportedly can access multiple host terminals and networks.

Of the Multi-Plex.25, the four-port version costs $1,395, and the eight-port version costs $2,100. For Multi-Switch.25, the four-port version costs $3,775, and the eight-port version costs $5,350.

A Packet Assembler/Disassembler, Multi-Pad.25, combines the features of Multi-Plex.25 and offers expanded user messages. The four-port version costs $2,995, while the eight-port version costs $3,995. Multi-Switch.25/2 features battery backup random-access memory and more memory than the Multi-Switch.25 model. The four-port Multi-Switch.25/2 costs $4,250, and the eight-port version costs $6,350 from the firm at 6464-G General Green Way, Alexandria, Va. 22312.

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Comsel Modem Retries Calls

VIENNA, Va. — Comsel Corp. has announced an auto-call modem with the ability to retry a call if the modem does not detect a carrier.

Called the Smart Auto Calling Unit, it can be operated over any dial pulse line. It can also detect secondary dial tones and can interface with all dial-in computer systems, the vendor said.

The modem is user-programmable for multiple sequences of telephone numbers and sign-on sequences, which are stored in nonvolatile memory. A secure model is also available. It will not display the security sign-on code and offers a mode-locked feature to prevent programming by other than authorized personnel, the vendor said.

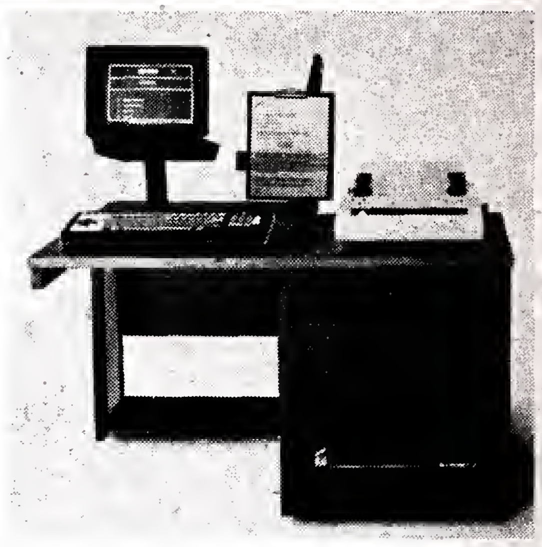
The unit costs about $500 and will be available in mid-1982, Comsel said from 8453-N Tyco Road, Tysons Corner, Vienna, Va. 22180.

EX855 Video Printer Released by Axiom

SAN FERNANDO, Calif. — A printer that reportedly produces hard copy from computer terminals, graphics terminals and video monitors has been unveiled by Axiom Corp.

The Model EX855 Video Printer promises high resolution of up to 650 dot/line and can reportedly transcribe any character size or font and foreign and scientific symbols. It copies the composite video information displayed on the screen onto electrosensitive paper and requires a single connection to a standard video jack.

The EX855 Video Printer is unit-priced at $1,595 and quantity discounts are available, the vendor said from 1014 Griswold Ave., San Fernando, Calif. 91340.



Micronet 8

Terminal Boasts 5M-Byte Winnie

PORTLAND, Ore. — Sidereal Corp. has unveiled a multiport telecommunications terminal that reportedly provides up to 5M bytes of message storage on a permanently installed 5¼-in. Winchester hard disk.

Micronet 8 also includes a removable 8-in. floppy disk for 1.2M bytes of additional storage.

The device features six ports that can be configured for any combination of telex, teletypewriter exchange, leased lines or direct-distance dialing (including some special IBM protocols). Fully concurrent, it can accommodate two workstations complete with keyboards, CRT terminals and printers. Two operators can prepare, send and receive messages at the same time.

The basic unit costs $17,900 from Sidereal at 9600 S.W. Barnes Road, Portland, Ore. 97225.

Local Networks Now Total 40

(Continued from Page 41)

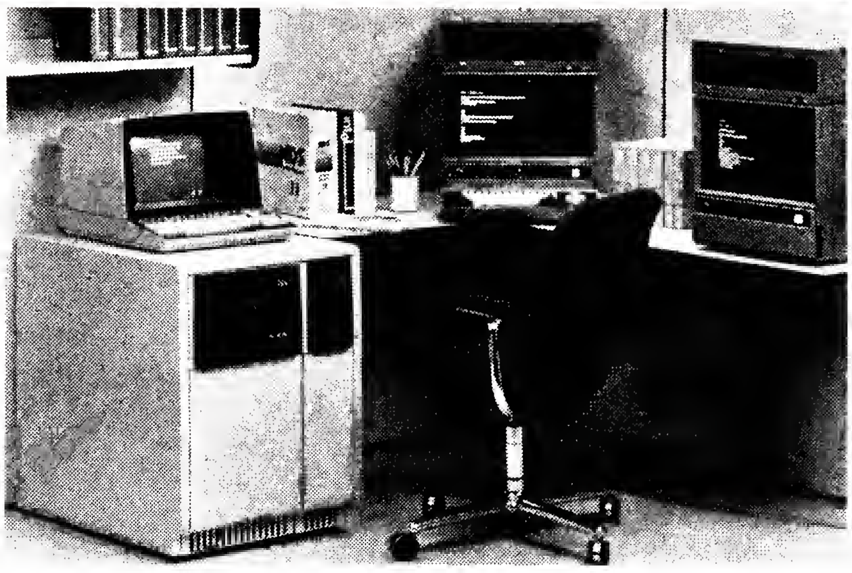
Below are brief descriptions of some of these specialized systems:

- The IBM 8100 Loop is locally or remotely connected to an 8100 system that operates as the master. The loop connects a variety of terminals, printers and other devices to the 8100, which can support up to 19 loops. The 8100 is used in an office environment, and it is also considered a distributed processor.
- Intenet, developed by Intecom, supports both voice and data transmission. It can interconnect up to 256 terminals and printers per module. The system is expandable to 16 modules, allowing interconnection of more than 4,000 devices.
- Datapoint Corp.'s ARC and the Stratus Stratalink were designed for distributed processing. ARC has been developed to accommodate integrated office applications.

As indicated by the accompanying chart, a local-area network is available today for almost any application. But if you cannot find what you want from one of these 40 vendors, do not despair. Given the current rate of local-net announcements — more than 20 new systems were unveiled between October 1981 and January 1982 — the one you need may be introduced at any moment.

This article is based upon information contained in a monthly updated, looseleaf Information Reference Service available from Data Decisions, Inc. at 20 Brace Road, Cherry Hill, N.J. 08034.

Micro Development System Based on Ethernet Local Net



Intel's Ethernet-based NDS II is shown above with two Intellec development systems.

SANTA CLARA, Calif. — Intel Corp. has unveiled a microprocessor development system based on Xerox Corp.'s Ethernet local-area network.

NDS-II permits upgrading of the existing installed base of Intellec systems as network workstations and their connection to the network. All Intellec models — from the MDS-800 to the Series III — can become network workstations.

Attached to NDS-II, those stations can share high-performance peripherals and a large, common data base, increasing the scope of their original design functions, Intel said.

NDS-II provides the environment and capacity for managing complex, multiuser computer-engineering and software-development projects, Intel said. It supports capabilities like distributed job control, which allows users to export jobs to available network resources.

The system includes an Intellink, which allows up to eight workstations and a network resource manager (NRM) to be interconnected without the expense of Ethernet transceivers.

The NDS-II Model iMDX-450A-035 consists of the NRM, one Intellink controller, a system control console, one 5¼-in. floppy disk drive, one 35M-byte Winchester disk drive, software, documentation and interconnecting cables. The price is $39,950.

The communications upgrade kit for Intellec Models 800, Series II/85 and Series III is the iMDX-455. It costs $2,000. The communications kit for the Intellec Series II/80, the iMDX-455I, costs $4,000, Intel said from 3065 Bowers Ave., Santa Clara, Calif. 95051.

Gandalf Modem Comes Coupled With Analyzer

WHEELING, Ill. — A 9,600 bit/sec synchronous modem with a built-in line analyzer has been developed by Gandalf Data, Inc.

Supermodem II, designed to increase link efficiency, transmits full-duplex synchronous binary serial data over either dedicated or dial-up voice-grade channels, the vendor said.

Single-channel units operate in continuous or simulated controlled-carrier mode, while four-channel units feature an integral four-channel multiplexer. Digital interfaces include RS-232C and CCITT V.24/V.28. Units function from 0°C to 50°C, available in stand-alone or rack-mounted units. Prices range from $3,300 to $3,740 from 1019 S. Noel Ave., Wheeling, Ill. 60090.

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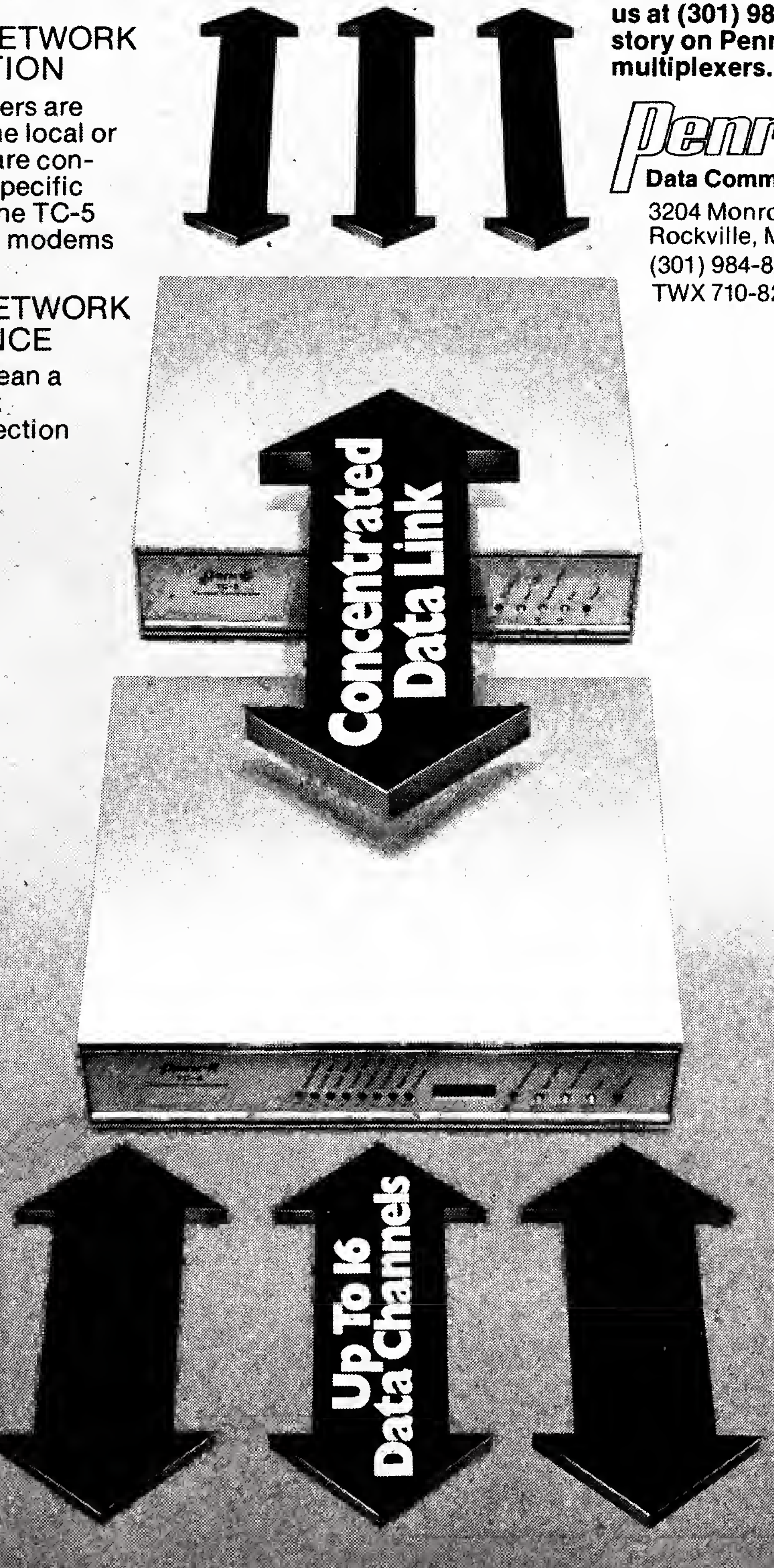

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Infotron Unveils Switching System

CHERRY HILL, N.J. — Infotron Systems Corp. has unveiled an intelligent switching system said to allow any terminal or computer port to talk to any other compatible terminal or computer port without patch panels, human intervention or moving cables.

The IS4000 capabilities include port and CPU contention, call transfer, camp-on and built-in diagnostics. The system collects billing data and provides console control of all operating parameters, including class assignments, speeds and keyboard selection routines.

The system can support up to 2,000 simultaneous connections of synchronous and asynchronous devices at speeds up to 19.2K bit/sec. The master/slave architecture permits the user to add capacity when and where it is needed.

A base configuration of the IS4000 costs $12,000, Infotron said from Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

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Service Offers Path Between Telemail, Telex

ATLANTA — Speedi Telex International is offering a service that provides a gateway between the Telemail electronic mail system and the international telex system. Telemail is available in 250 metropolitan areas nationwide, Speedi said.

The service permits users with CRT terminals, word processors or personal computers to send and receive telex messages to or from the 1.5 million telex terminals installed worldwide, without extra equipment, software or installing a telex access line, Speedi said.

More than 80 different terminals, portable terminals and personal computers (including Apple Computer, Inc.; Atari, Inc.; Commodore Business Machines, Inc.; IBM; and Radio Shack) can be used to send and receive telexes via the Speedi system.

Users pay by telex time and connect time for Telemail, Speedi said from Lenox Towers, 3400 Peachtree Road, N.E., Atlanta, Ga. 30326.

Time Recorder Out for T/S

PENNSAUKEN, N.J. — A "charge-back" recorder to provide records of terminal use, including user code name, purpose and actual time use, for time-sharing companies is available from Danyl Corp.

The recorder allows users to keep track of the actual amount of time used by entering an identification code into the System 80 Terminal Controller, the vendor said. The code opens the CRT terminal and allows it to transmit. The System 80 connects in series with standard RS-232 ports and does not require CRT or terminal modification.

Entry codes may be entered via key pad or badge, the vendor said, adding that complete records of user identification, applicable accounting codes and transaction time are recorded on cassette tapes. Hard-copy cost reports can be made from the tapes for management review and charge-back accounting.

The recorder is available through direct-purchase or lease/purchase terms. The price for the basic recorder is $3,200. Lease rental is $166/mo for 12 months or 24 months. Rental is $120/mo for 36 months.

The recorder is available from Danyl, located at 200 Cooper Center, Pennsauken, N.J. 08109.

CDC Enhances CRT Terminal For IBM Series/1

MINNEAPOLIS — Control Data Corp. has introduced two enhanced models of its CRT terminal designed for use with the IBM Series/1 minicomputer.

The Certainty 610 series CRT terminals are available with either a data entry keyboard layout — Model 610-12 — or a typewriter keyboard that includes a 10-key numeric pad and 24 function key capability — Model 610-16 — the vendor reported.

Both models interface to the Series/1 processor using a display station attachment card that is housed in the processor or in the input/output expansion unit.

The terminals feature a 12-in. diagonal screen that contains up to 1,920 alphanumeric characters of information arranged in a 24-line by 80-char. format. The screen also displays a 25th line to provide operators with the output stature of user application programs, the vendor reported.

The single unit end-user price of both displays is $3,700 available from CDC, Box O, Minneapolis, Minn. 55440.

Hinet Local Net Gets User Station

OAKLAND, Calif. — Digital Microsystems, Inc. has introduced a 16-bit user station for its Hinet local-area network.

The DSC-3B/16 is the 8086 version of the Zilog, Inc. Z80A-based DSC-3B, which is said to provide both serial and parallel I/O and can be connected to an RS-232C terminal. The stations reportedly can be interspersed with the standard 8-bit DSC-3Bs in the Hinet network and can run Digital Research, Inc.'s CP/M86 operating system and the CBasic-86 and Pascal-86 languages.

The station is said to provide 256K bytes of random-access memory, expandable up to 1M byte. The DSC-3B/16 lists for $2,995 from the firm at 1840 Embarcadero, Oakland, Calif. 94606.

Xycom Introduces Serial Controller

ANN ARBOR, Mich. — A general-purpose serial communications controller said to allow host-to-host, host-to-four targets or host-to-four terminals communications is available from Xycom, Inc.

Model 1847 Plus is a Z80-based intelligent module that reportedly offers four channels of either asynchronous or bit synchronous communications. Each channel can be independently configured in bit synchronous record mode or asynchronous record mode.

All four channels reportedly have on-board size buffering, on-board or external transmission rate generation.

The unit costs $1,545 from Xycom at 750 N. Maple Road, Saline, Mich. 48176.

Field-Installable Graphics Option Fits DEC-Compatible Units

ANAHEIM, Calif. — Cobar, Inc. has introduced a field-installable graphics option for its Model 3100 and 3132 CRT terminals, which are compatible with Digital Equipment Corp. VT100 and VT132 terminals.

The option, which was built around the Selanar Corp. graphics board, features a graphics generator said to provide two modes of operation. The Tektronix, Inc. 4010 compatibility mode allows the terminal to be used with Plot 10 or any of the software packages supporting Tektronix 4010.

A native mode provides specification of plotting functions such as vectors, area fill, programmable scale factor and relocatable display window origin. User-selectable character sets include Ascii, APL, Math and a user-definable font, the vendor said. Variable character size, intensity and character rotation are also provided.

Interactive graphics capabilities are provided, with an addressable plot area of 65,536 points by 65,536 points and display resolution of 1,225 points by 240 points.

The graphics options are priced at $1,475 for the Model 3100 and $1,575 for the Model 3132 from Cobar, 1181 N. Fountain Way, Anaheim, Calif. 92806.

Datashare Users Get Dual-Mode Printer

WICHITA, Kan. — DP-Tek, Inc. has introduced a printer for users of Datapoint Corp.'s Datashare operating system. It is both a terminal printer and a screen-image printer.

The Imprint/3 emulates a Datapoint terminal printer and also produces a hard copy of the screen image. It is plug-compatible with Datapoint 3600/8200 terminals and can be easily installed, the vendor said.

The screen-image feature requires no hardware or software changes to the Datapoint system. Other features include selectable character fonts, selectable forms length, block-graphics characters and vertical tab controls. It will accommodate pin-fed paper, single-sheet cut paper and continuous-roll paper, the vendor said.

Model 8302 of Imprint/3 has a 9½-in. paper carriage allowing the printer to print 80 col at 10 char./in. or print 132 col at 16.5 char./in. Model 8303 has a 15-in. paper carriage allowing 1,322 char. at 10 char./in.

The cost of the Models 8302 and 8303 are $1,695 and $2,049, respectively, from DP-Tek, P.O. Box 2411, Wichita, Kan. 67201.

Artel Unveils Interfaces For Graphics

WORCESTER, Mass. — A line of fiber-optic computer graphics interfaces has been unveiled by Artel Communications Corp.

The 2010-Series of interface modules allows users of high-speed video graphics to locate their monitors up to 30 times farther from the computer than is possible with conventional coaxial cable, according to the vendor. It can transmit RS-170-compatible video graphics with bandwidths of up to 30 MHz over long runs of fiber-optic cable (up to 10,000 ft compared to 300 ft for coaxial cable).

The plug-in interfaces hooks up to the SL-2000 nine-channel mainframe and can be combined with other video, data or audio signal modules in the fiber-optic network. The 2010-Series can accommodate both color and monochrome transmissions.

Depending upon the application, the 2010-Series is available from $2,500, according to the vendor at P.O. Box 100, W. Side Station, Worcester, Mass. 01602.

Satellite Option Fits 201C Modem

HUNTSVILLE, Ala. — A strappable satellite communications option has been added to the 201C data modem offered by Universal Data Systems, Inc.

The device was previously applicable for 2,400 bit/sec data communications via two-wire direct-distance-dialing circuits or four-wire private lines.

In addition to satellite communications capability, Universal Data Systems has added antistreaming protection to improve performance in multidrop systems.

The 201C is certified by the Federal Communications Commission for direction to the public-switched telephone network, eliminating the need for separate data access arrangements, according to the vendor.

The unit includes an integral 511 test-pattern generator for self-test, analog loop, end-to-end transmit and receive testing.

It is available in board, rack-mountable or free-standing configurations and is base priced at $775, according to the vendor at 5000 Bradford Drive, Huntsville, Ala. 35805.

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There is an art—and a considerable amount of science—to designing and delivering data communications products that meet the rigorous demands of today's 3270-compatible marketplace. Products such as display stations, printers and controllers that more dynamically and productively interact with each other, with compatible system equipment and with the people who use them. Products that save more energy, space and money. Products that perform more reliably. Products that are more readily available and more fully supported. These three products, for instance.

Product Set: Memorex 2078 Display Station; Memorex 2087 Matrix Printer; Memorex 2076 Remote Cluster Controller.

System Interfaces: IBM Systems 360, 370, 303X and 43XX.

Compatibility: IBM 327X plug compatible; Bisynchronous; SNA/SDLC (2078/2087).

Product Specifics: The 2078 Display Station is built for flexibility, operating in bisynchronous as well as SNA/SDLC environments. It is built compactly to conserve space and even features a monitor that detaches for shelf placement. It is built to conserve energy, with efficiency features that allow the 2078 to operate on 58% less power while generating 41% less heat than its IBM equivalent. It weighs just 55 pounds, some 47% lighter than the IBM competition. And above all, the 2078 is built for people. The monitor is tiltable and the screen recessed. That screen, the keytops and all moldings are non-glare. The keyboard is movable for comfortable positioning.

The 2087 Matrix Printer also features SNA/SDLC protocol compatibility in addition to bisynchronous operation. It is both fast and quiet. A microprocessor-controlled print mechanism delivers high quality printouts at speeds up to 50% faster than the IBM equivalent. A bidirectional matrix print head seeks the shortest path to the next line, backwards and forwards, maximizing throughput. Acoustical engineering reduces noise levels, while a membrane switch panel, controls and LED indicators, all located on the front panel, provide the operator with local control and printer status.

The 2076 Remote Cluster Controller is a lightweight 30-pound package that accommodates up to eight printers and/or terminals in a bisynchronous environment. It measures a streamlined 6.5" high x 14" wide x 26" deep. While the 2076 can be located as far away as 4920 feet from its attachments, its dimensions allow for convenient placement just about anywhere, singly or stacked. Standard power-on, off-line and on-line diagnostics contribute to increased uptime.

Memorex. The Communications Group. For more information, contact Laurie Schuler at 18922 Forge Drive, Cupertino, CA 95014-0784. Or call (800) 538-9303. In California, call (408) 996-9000, Ext. 222.

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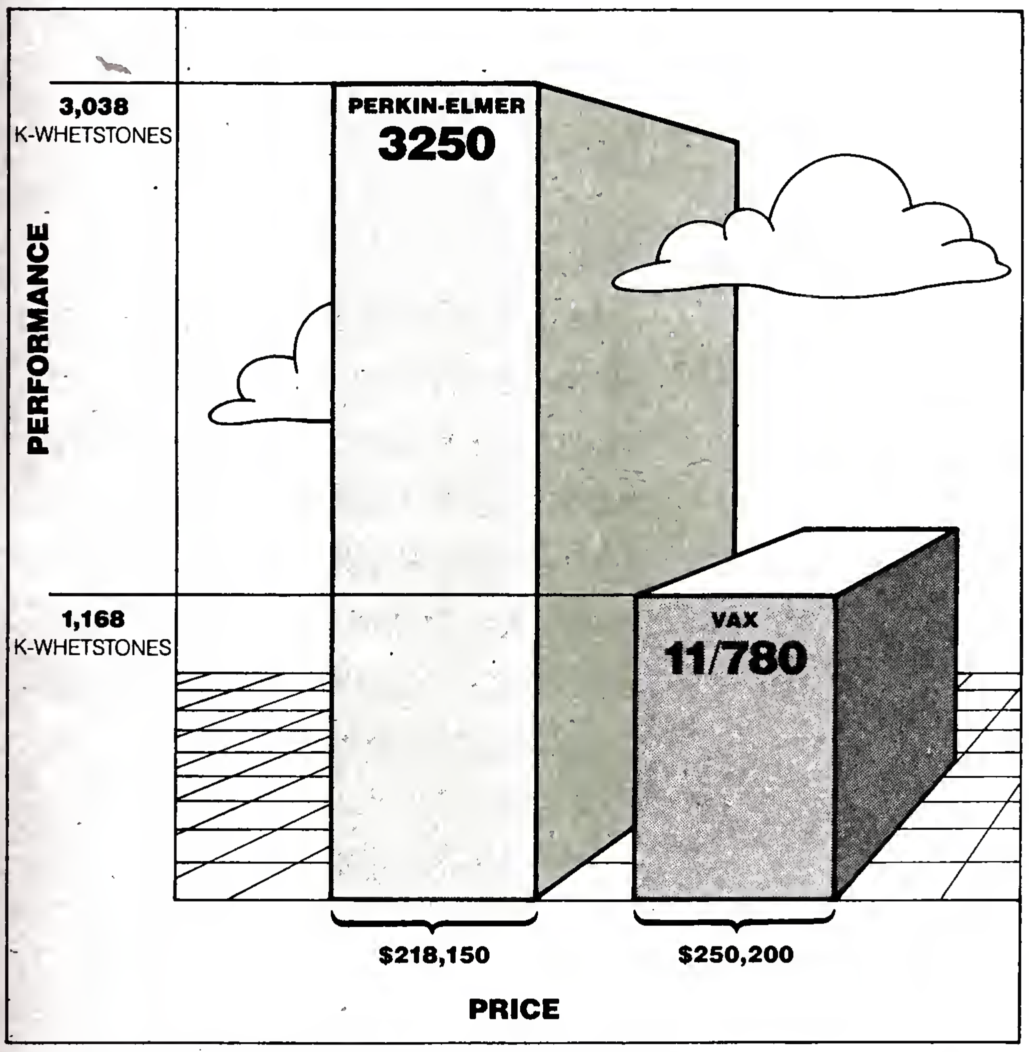

Based on comparable configurations, the new 3250 with FORTRAN VII Z delivers more performance for less money than VAX 11/780.

The new Perkin-Elmer 3250 tops the VAX 11/780 in every critical category: processing power, system capacity and throughput. At prices starting as low as $150,000 with 2MB of memory.

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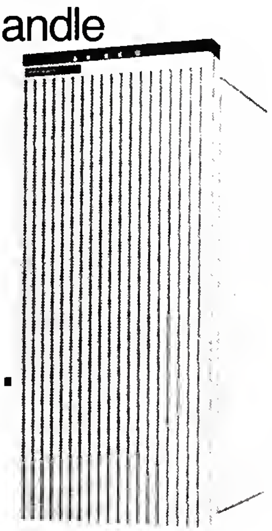
Utilizing state-of-the-art 64K RAM technology, the 3250 packs up to 16MB of directly addressable memory in a single 24″ wide x 56″ high cabinet. DEC doesn't offer that much memory in *four* cabinets.

The 3250's dual 32-bit memory bus delivers 40MB/second I/O bandwidth and 64MB/second peak system throughput rate. It can handle up to 115 gigabytes of on-line storage and control over 1,000 I/O devices. VAX, with its single bus architecture, just can't touch these specs.



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With Data, Image Processing

Photo Firm Develops Paperless System

ROCHESTER, N.Y. — Eastman Kodak Co.'s regional distribution center — the largest of nine centers located throughout the country — handles more than 250,000 orders per year. However, it operates virtually a paperless order entry and processing system by using both data and image processing indexing methods.

Together, the two methods are said to save 90% of the time needed for data entry and more than $12,000 in maintenance costs — providing a 42% return on investment for the equipment involved in the system.

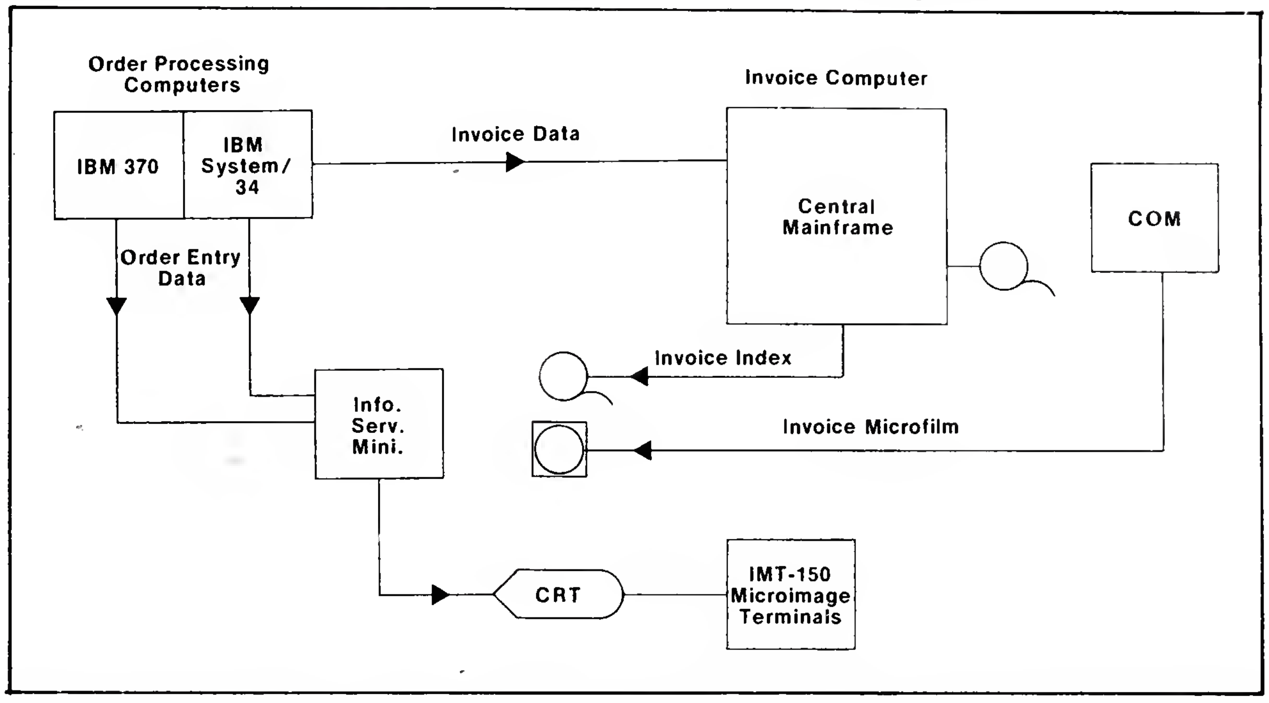
While the center stocks more than 9,000 products, most orders are received and acted upon electronically. The firm still receives or generates some 5,500 documents per day — which results in about 8,500 pieces of paper. But this paper is later keyed into one of two order processing computers and then microfilmed, eliminating the need for paper copies, according to J. Douglas Baldy, manager of Kodak's administrative services.

Two Computers

The processing system is based on two computers: an IBM 370/148 and an IBM System/38, which process customer orders and keep data in memory until after the orders are shipped, Baldy said. The computers also generate such data as shipping orders, packing memos and bills of lading. The two computers perform parallel functions, but for different classes of trade.

Invoicing is kept as paperless as possible, Baldy continued. The main IBM computer, located here, prints out paper invoices that are mailed to the customers. As a by-product, the computer also creates two magnetic tapes. One tape goes to a computer-output microfilmer where it is transferred to

(Continued on Page 50)



Data for the microfilm index reaches the Information Services mini from three different computers in two different locations.

Before the documents are microfilmed, they are sorted by document type. This is the first step in the coding process.

Data Base Processor From Intel Can Be Shared by Various CPUs

PHOENIX — Intel Corp. has introduced a dedicated-function data base processor that performs file and data base management functions for applications executed on separate computer hosts.

Intel's Data Base Processor (IDBP) is not only designed to off-load data base chores from the host computer, but can be shared by a variety of computers at separate locations. Basically, the processor is said to give smaller systems many of the data-handling capabilities found only in larger mainframe systems.

Although primarily aimed at OEMs and systems integrators, the "black box" device is also geared for large-systems end users. In fact, the system can be used with distributed minicomputers and microcomputers — particularly in the high-volume business and office environment — or as part of a centralized mainframe system.

In operation, the IDBP acts as a slave to the host computers, performing data base management functions. The device is capable of executing two transactions per second, typically consisting of from 20 to 24 disk accesses plus the associated data processing.

IDBP Features

IDBP features include data definition, selection, retrieval, update and deletion; full-access control; concurrency control; transaction logging, recovery and restart; data integrity checking; an integrated data

(Continued on Page 50)

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Gould's SEL Division Offers Three 32/87-Based Systems

FORT LAUDERDALE, Fla. — Gould, Inc.'s SEL Computer Systems Division has announced three packaged computer systems, based on its high-performance 32-bit Concept 32/87 minicomputer, that incorporate 64K-bit memory chip technology enhancements.

The firm also announced two other memory enhancement products for its superminicomputer, as well as a Winchester disk drive.

Although architecturally the same, the 32/87's memory has been enhanced with the addition of 256K- to 1M-byte Integrated Memory Modules (IMM) that are designed with 64K-bit high-density chips. The IMMs are said to deliver a fourfold increase in memory density over earlier memory designs.

The first package, the 3821, features the processor and four 256K-byte IMMs. The modules are supplemented with a memory bus controller and error-checking and correcting logic, a spokesman said.

The second and third packaged systems offered by the firm — the 3822 and 3823 — include either two 512K-byte or two 1M-byte IMMs, respectively.

All 32/87 computers in the packages include a 32-bit emitter-coupled logic-based CPU, with a performance rated at 3.7 million instructions per second; a floating-point processor; a 32K-byte cache memory; an I/O processor; a diagnostic processor; two floppy disk drives; and a CRT console. The systems also have a 64-bit wide internal bus for high throughput speeds, the spokesman noted.

The 3821 costs $265,000, while the 3822 and 3823 are priced at $260,000 and $270,000, respectively.

For existing Concept/32 computer users, a 1M-byte add-on IMM costs $16,500.

SEL's memory enhancements, the Z-Card and the Multipurpose Custom Interface (MPCI), are geared to increase the transfer rates of the system's processor. The Z-Card is a microprocessor-based memory device that is user-programmable and allows a 200K byte/sec transfer rate. The MPCI features a maximum 1M byte/sec transfer rate. The Z-Card costs $2,600, while the MPCI sells for $2,200.

Finally, SEL introduced an 80M-byte Winchester disk drive that can reportedly be used with either of two controllers on the Concept/32 computers. The disk with an I/O processor costs $15,900; with a Disk Processor II controller, it costs $22,500, the spokesman said.

Gould SEL, which previously did business as Systems Engineering Laboratories, Inc., can be reached at 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

Photo Firm Goes Paperless

(Continued from Page 49)

16mm roll film; the other tape is an index to the invoice images.

Everything comes together at Kodak's Information Services Division. Until recently, the firm used a standalone, automated-retrieval microfilm method for records storage. However, as that 13-year-old system began to wear out, Kodak adopted a distributed electronic filing method that utilizes a Data General Corp. Nova 4 minicomputer and four Kodak IMT-150 microimage terminals, Baldy said.

After order data is edited from the computers — usually within 20 days — the Information Services Division maintains the only detailed record of customer transactions. Although archival in nature, the information usually does not remain idle. In fact, Information Services averages about 210,000 retrievals per year on data that it has stored on microfilm, Baldy pointed out.

Complete Indexing

The minicomputer in Information Services interacts with the two IBM computers to provide a complete indexing system. The mainframes strip off nine index parameters from their data each day and download them into minicomputer memory. Later, it is matched with the microfilm roll and frame number address of the appropriate microfilm images, Baldy said.

The microfilm is also encoded with three different size image marks at the time of filming using a Recordak Reliant microfilmer. The marks signify document type to the microimage terminal, the first page of each document and subsequent pages. Other marks lead the operator to the right image and pinpoint the document-type image mark within each rule, he noted.

Intel Processor Can Be Shared

(Continued from Page 49)

dictionary; and parametric command-macro support, a spokesman said. In addition, the processor can manage not only the kinds of structures found in conventional data base systems, but also the files of arbitrary structure, including text strings, the spokesman continued.

Two Micros

The IDBP contains two 16-bit microprocessors, one dedicated to front-end control, the other for operating system and data base management system software.

The IDBP costs $15,800 in a typical configuration, which includes 512K bytes of random-access memory, an RS-232 personality interface module and a storage module device disk interface that can support up to four drives. The system can be expanded to include up to four controllers and a variety of interfaces including IBM's synchronous data link control and higher data link control, parallel and the local-area Ethernet network, the vendor spokesman said.

Additional information on the IDBP can be obtained from Intel at 2402 W. Beardsley Road, Phoenix, Ariz. 85027.

Winchester Disk Subsystems Introduced for DEC LSI-11s

IRVINE, Calif. — Four Winchester disk subsystems that run on Digital Equipment Corp. LSI-11 microcomputers are available at a reduced introductory price from Plessey Peripheral Systems, Inc.

Each Winchester drive is configured as two, 14M-byte RK06 units for 28M bytes of data storage, according to the vendor. Each PM-FCV06 controller will interface up to four drives for a total subsystem capacity of 112M bytes.

The four subsystems are available at a reduced price until April 30. The subsystems are said to include the following:

- PM-FSVO6J features 28M bytes of Winchester storage. The quad-wide controller installs into any Q-bus-compatible backplane. The price is $6,468.
- PM-FSVO6JJ provides 56M bytes of storage for expansion of existing LSI-11 systems. The drive features a transfer rate of 912K byte/sec. The price is $10,812.
- PM-FSVO6ZJ has 28M-byte fixed Winchester storage and 1.2M-byte, double-sided, dual floppy for backup. It includes quad-wide Winchester controller and dual-wide floppy controller. The price is $7,964.
- PM-FSVO6TJ provides archival storage and software distribution; it also combines a 28M-byte 8-in. Winchester with ¼-in. streaming tape for backup. The price is $8,496.

The subsystems are available from the Marketing Department of Plessey Peripheral Systems, 17466 Daimler, Irvine, Calif. 92714.

Charles River Data Adds Two Desktops To 'Supermicro' Line

NATICK, Mass. — Charles River Data Systems, Inc. (CRDS) has expanded its 32-bit Universe 68 supermicrocomputer line by adding two desktop systems, one of which is reported to have up to 512K bytes of memory on a single board.

The Universe 68/15, which previewed earlier this year at the winter conference of the Unix Users Group, incorporates a 32-bit central processor, 256K bytes of main memory and a 16M-byte Winchester disk drive.

The second system, the 68/17, is similar to the first except that it contains a 512K-byte memory board that allows users to expand system memory up to 2M bytes in a 7-in.-high cabinet, a spokesman said.

Like previous systems in the CRDS supermicro lineup, the 68/15 and 68/17 are based on a Motorola, Inc. 68000 32-bit microprocessor. They were designed to compeie primarily against high-end 16-bit minicomputers like Data General Corp.'s Nova and Digital Equipment Corp.'s PDP-11 series, according to the vendor.

Both 32-bit systems run under Unos, a Bell Laboratories Unix-compatible operating system developed by the Natick firm, according to the vendor.

Extensions of Unix built into CRDS Unos include a process-synchronizing event-count scheme for real-time transaction-oriented applications, interactive debugging, a screen editor and support for extensive data base management routines, the vendor spokesman noted. All of these extensions are reportedly not available with Unix.

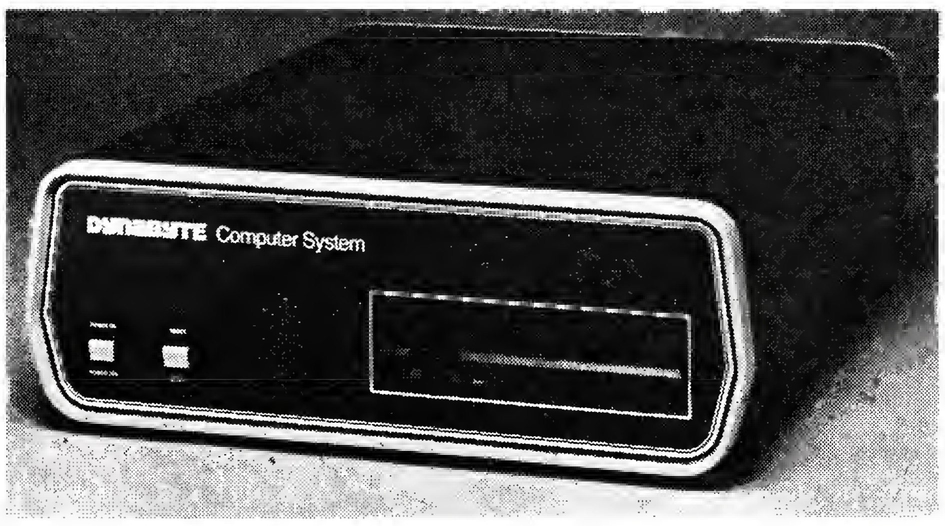
CRDS Unos does include such Unix features as file management facilities, like dynamically grown files; device independence; I/O redirection; and "pipes," a method for allowing the output of one process to be the input for a second process, the spokesman explained.

Languages supported by the systems include Fortran, Basic, C and Pascal. Applications developed and run under the Bell-licensed Unix operating system usually require a recompilation to run under Unos, the vendor added.

The base price of the 68/15 is $19,200, while prices for the 68/17 begin at $21,200. CRDS is located at 4 Tech Circle, Natick, Mass. 01760.

High-Capacity Winchester Drive

Desktop Micro Supports Eight Users



Dynabyte Model 5605

MILPITAS, Calif. — Dynabyte, Inc. has unveiled a multiuser desktop microcomputer that can support up to eight users and features a high-capacity Winchester disk drive.

Targeted for the small business user, the Model 5605 can handle eight CRT stations and 16 printers and provides up to 19M bytes of on-line disk storage contained on a 5¼-in. hard disk. Disk capacities range from 6M- to 19M bytes and are supplemented by 800K- or 1.6M bytes of single- or double-sided diskette storage, according to the vendor.

Like other members in the 5000 series, the 5605 runs under Digital Research, Inc.'s CP/M and MP/M or Phase One Systems, Inc.'s Oasis operating systems. Languages include: Basic, Cobol, Fortran, Pascal and PL/I, the vendor said.

The system can also use Dynabyte's applications software such as: Business Manager, an integrated accounting package for single- or multiple-terminal business program implementations; Business Planner, a financial planning package; and Wordstar, a word processing package, a spokesman said.

The 5605-A1 with 6M bytes of hard disk costs $7,295; the 5605-B2 with 12M bytes costs $7,995; and the 5605-C2 with 19M bytes of disk storage sells for $8,995.

Dynabyte is located at 521 Cotonwood Drive, Milpitas, Calif. 95035.

Memory Capacity, I/O Ports Increased for Mark 3 Minis

IRVINE, Calif. — Point 4 Data Corp. has increased the memory capacity and number of I/O ports available on its Mark 3 line of minicomputers.

The maximum main memory available on the Mark 3 has been doubled from 64K bytes to 128K bytes, according to the vendor. In addition, the user I/O ports available on the system have been increased from four to seven.

The vendor claims the two enhancements will increase performance on the Mark 3 by up to 400%.

The memory expansion board costs $1,200. The port expansion board costs $900, the vendor said from 2569 McCabe Way, Irvine, Calif. 92741.

HP A600, A700 Users Offered Half-In. Magnetic Tape System

SAN DIEGO — Dylon Corp. has introduced a hardware- and software-compatible ½-in. magnetic tape system for Hewlett-Packard Co. A600 and A700 series high-speed microcomputer processors.

The Dylon Series 10 operates with the existing HP operating system tape drive software and also uses HP's tape drive diagnostic software for equipment maintenance and testing. It is said to operate at speeds up to 125 in./sec, offering a data recording rate of 200K byte/sec.

The tape system reportedly offers the user full dual-density 800/1,600 bit/sec. flexibility in start/stop tape equipment at speeds ranging from 25 to 125 in./sec and reel sizes from 600 to 3,200 feet. Up to four magnetic tape transports can be connected to the Dylon controller, allowing seven-track and nine-track transports to be intermixed.

More than 55M bytes of data can be stored on a single reel of ½-in. magnetic tape, the vendor said.

The Series 10 price ranges from $8,995 to $15,252 from Dylon, 9561 Ridgehaven Court, San Diego, Calif. 92123.

Altos Cuts Price on Series 5

SAN JOSE, Calif. — Altos Computer Systems, Inc. has announced reductions of $1,500 on each of its Series 5 multiuser microcomputers for small-business and industrial users.

While the actual price of each model will be reduced by $1,000, all systems will be shipped with the MP/M multiuser operating system included, a $500 added value, according to the firm.

The Series 5-15D with dual 5¼-in. floppy drives will now sell for $2,900, and the Series 5-5D with 5M-byte 5¼-in. Winchester hard disk and 1M-byte single floppy storage will cost $5,990 from the firm at 2360 Bering Drive, San Jose, Calif. 95131.

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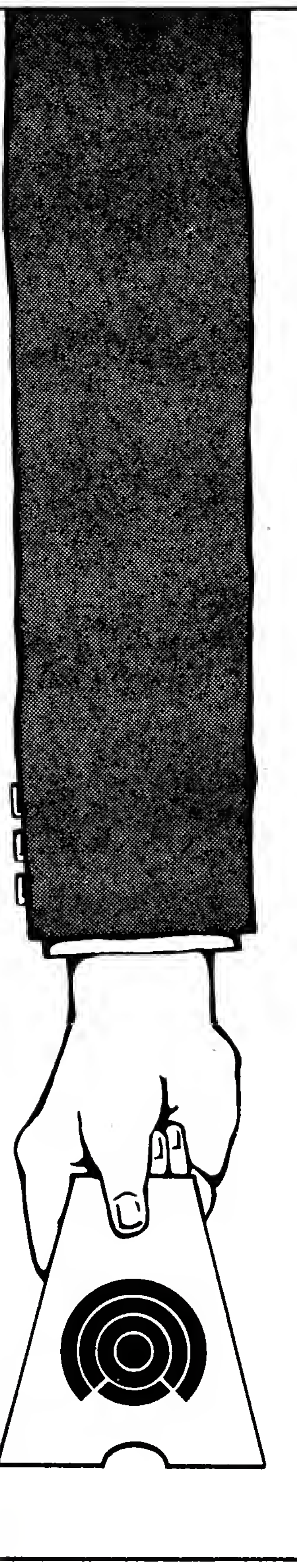

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Centurion Adds Two To Hardware Systems

RICHARDSON, Texas — Centurion Computer Corp. has added two Winchester-based hard disk computer systems, the Series 5200 and 5300, to its hardware product line.

The Series 5200 is said to include a central processor, one 1.23M-byte flexible disk drive, a CRT terminal and a 24M-byte Winchester disk drive. A 32M-byte Winchester drive is also available.

The 5300 can support two 32M-byte drives for a total capacity of 64M bytes and a maximum of 10 CRT terminals, the vendor said.

Both systems have 64K bytes of main memory expandable to 256K bytes, according to the vendor. Matrix, line and character printers are available for these systems.

The 5200 costs $21,222; the 5300 is priced at $23,352. Both are available from Centurion dealerships.

Centurion Computer is located at 1780 Jay Ell Drive, Richardson, Texas 75081.

Campus Setup Tied to VAX

FAIRFIELD, Ohio — Management Decisions Development Corp. (MDDC) has announced that its Campus Administration, Registration and Student (Cars) system is now available with Digital Equipment Corp.'s VAX-11/750 and VAX-11/780 computers.

Also available on General Automation, Inc. (GA) minicomputers, Cars handles both administration and student instruction on a single processor. MDDC decided to add the VAX computers to its turnkey system because those machines are reportedly two to six times more powerful than the GA 480, depending on the operations being performed.

On the VAX equipment, Cars will run under Bell Laboratories' Unix III operating system. The Unix operating system and compilers in Cars are scheduled for delivery in June for student instruction and research.

The only difference in support between Cars systems running on GA equipment and VAX equipment will be that the VAX equipment will normally be maintained by DEC.

In addition to implementing Cars on a full turnkey basis, MDDC will offer both the system software and administrative application software on a modular basis.

Turnkey Cars systems begin at $75,000 on GA processors or $175,000 on VAX machines. Final pricing is dependent on the users' specific configuration.

The next four-week Cars training program is scheduled to begin July 12 in Cincinnati; on-site implementation will commence in the fall. MDDC is at 7209 Dixie Highway, Fairfield, Ohio 45014.

Finance Tool Targets Contractors

LOS ANGELES — A Digital Equipment Corp. PDP-11-based turnkey financial system for building contractors that is said to improve accounting control and job cost accuracy has been announced by Continuum Systems, Inc.

Construct II includes hardware, special application software and ongoing support. In addition, a new computer-to-computer software service is offered by telephone.

The system reportedly provides financial reports on accounts payable, payroll, accounts receivable and general ledger, as well as job costing, estimating and payroll analysis.

Prices for Construct II including computer, a terminal, Winchester disk drive with file backup and a printer start at $19,950 or $525/mo on a lease/purchase agreement from the firm at 6820 La Tijera Blvd., Los Angeles, Calif. 90045.

Interface Fits DEC Systems

SAN LUIS OBISPO, Calif. — Ziatech Corp. has announced the ZT 85/18, an IEEE 488 controller interface for Digital Equipment Corp. Multibus systems.

The Ziatech unit provides the Multibus system with the capability of hooking multiple instruments, peripherals and processors into a single I/O slot, according to the vendor.

The ZT 85/18 interface can be used with any Multibus-compatible systems, including Intel Corp. 8086 and Motorola Corp. 68000 microprocessors, the vendor said.

The ZT 85/18 controller interface is priced at $595, according to the vendor.

Ziatech is located at 3433 Roberto Court, San Luis Obispo, Calif. 93401.

Prevalence in Office to Continue

Voice Seen Top Communications Form

By Bruce Hoard
CW Staff

CAMBRIDGE, Mass. — "Voice is, and will continue to be, the most prevalent form of office communications," according to a recent study from The Yankee Group entitled *Voice Communications: New Technologies and Markets.*

The report focuses on the current and near-future markets and applications for products and subsystems that manipulate voice, including voice store-and-forward, private branch exchanges (PBX) and voice concentrators and multiplexers.

The digital-voice store-and-forward market amounted to $6 million in 1981, the report noted, adding it will increase this year as companies such as Wang Laboratories, Inc. and IBM begin shipping their systems.

The technology involves digitizing a voice message, storing it on a magnetic disk and then calling or "reconstituting" it for delivery to the recipient.

It is seen as a vehicle for realizing "nonsimultaneous" voice transmission and escaping "telephone tag."

Verbal Electronic Mail

"Voice store-and-forward is basically verbal electronic mail and is an excellent alternative for executive users who loathe keyboards, yet want to take advantage of electronic mail's benefits," the study said.

It can also be combined with alphanumeric electronic mail to increase that medium, the report added.

The market will expand rapidly over the next five years as the technology is integrated into users' overall office automation systems. Driven by decreasing processor and disk-memory costs, prices — which currently average $500 to $600 per user — will drop to around $200 per user.

Voice store-and-forward is a "perfect modular addition" to PBXs, and the report predicts PBX vendors will increasingly incorporate it in their offerings. By 1985, the market may approach $350 million to $450 million.

"PBXs and their associated peripherals and software are the most important system in the customer-premises voice-equipment market," the report said. "The 1981 shipment value of PBXs (on an 'if-sold' basis) was about $2.75 billion and will grow to about $5.6 billion by 1985."

Devices' Potential

The devices have the potential to incorporate all other voice functions and applications that presently run on stand-alone equipment in addition to handling many data-switching and networking functions.

Innovative vendors are putting pressure on traditional vendors such as AT&T by forcing them to react to their state-of-the-art products. According to the report, "true" voice/data PBXs are becoming available, and the evolution toward machines that will act as "networked gateway nodes" will continue.

AT&T's installed market share by installed lines has fallen from 76% in 1980 to a projected 49% in 1985, and Bell shipped only 36% of PBX lines in 1981.

The $25 million market in 1981 will grow from $65 million to $75 million by 1985, the study predicted.

Voice Communications: New Technologies and Markets costs $15,000 for clients and $20,000 for nonclients, The Yankee Group said from Harvard Square, P.O. Box 43, Cambridge, Mass. 02138.

For Non-DPers From Datapoint

'Spread-Sheet Simulator' Announced

SAN ANTONIO, Texas — Datapoint Corp. has unveiled a software "spread-sheet simulator" for financial forecasting and modeling.

Multiplan was designed for non-DP personnel and provides a numeric work sheet for use in capital management, financial analysis, accounting, market analysis and other spread-sheet applications. It is said to give users a highly interactive, user-friendly, easy-to-learn tool for manipulating arithmetic information.

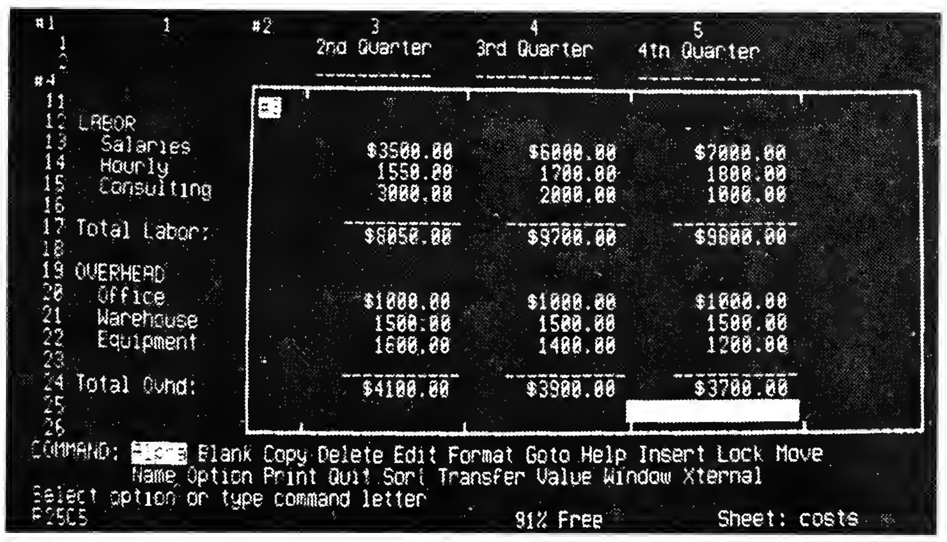
The software will run on any Datapoint Model 1800, 3800 or 8600 processor with at least 96K bytes of memory that uses the vendor's disk operating system. Multiplan may be operated from a processor that is part of a Datapoint Attached Resource Computer local network, according to the vendor.

The product reportedly revolves around the use of an oversize dynamic electronic "work sheet," 63 columns wide by 255 rows long. At any one time the screen displays 19 rows and as many variable-width columns as will fit the screen.

Multiplan displays a complete plain-language command menu on the bottom of the screen and tells the user what the next logical step would be. The menu includes a HELP command that will provide a detailed explanation of the other commands, a spokesman said.

Reports generated under Multiplan can be charted using Datapoint's color business graphics system. Reports can also be called and automatically added to the text being processed by the Integrated Electronic Office System word processing system.

The initial release of Multiplan is free; a standard media cost will be charged. Media charges vary according to type. Typical charges include $15 for diskettes, $180 for 10M-byte cartridge disks and $385 for 25M-byte cartridge disks, Datapoint said from 9725 Datapoint Drive, San Antonio, Texas 78284.



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#1        1       #2      3              4              5
   1                      2nd Quarter    3rd Quarter    4th Quarter
   2                      -----------    -----------    -----------
#4
 11
 12 LABOR
 13   Salaries              $3500.00       $6000.00       $7000.00
 14   Hourly                 1550.00        1700.00        1800.00
 15   Consulting             3000.00        2000.00        1000.00
 16
 17 Total Labor:          -----------    -----------    -----------
                            $8050.00       $9700.00       $9800.00
 18
 19 OVERHEAD
 20   Office                $1000.00       $1000.00       $1000.00
 21   Warehouse              1500.00        1500.00        1500.00
 22   Equipment              1600.00        1400.00        1200.00
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Screen Picture of Multiplan

WP Package Runs on Nova-, Eclipse-Compatible Systems

TUSTIN, Calif. — A word processing package designed to run with the firm's Data General Corp. Nova-compatible operating system is available from Dynamic Concepts, Inc.

Sentex runs on any DG Nova- or Eclipse-compatible computer and features full text-editing capabilities, modify and print routines and access to a mailing-list package.

The package displays an index of documents (optionally by key) on request. A text-file check routine ensures that only the most recent version of any document is preserved in the system's files.

Documents in those files may be copied, deleted, amended, formatted or printed. Files also may be added from — or dumped into — any other part of the system for the editing of reports produced by other programs.

A file-chaining feature allows documents to be constructed during printing, reportedly eliminating retyping of semi-standard documents. For small-run mailings of individual form documents like contracts, data can be inserted from the keyboard when the document is processed before printing.

Sentex costs $2,000 from Dynamic Concepts at 14712 Franklin Ave., No. F, Tustin, Calif. 92680.

OCR Reader Sends Data to WP Unit

CHICAGO — An optical character recognition (OCR) reader that scans typed copy, digitizes it and then transmits the data to a word processor from where it can be stored on a disk is available from A.B. Dick Co.

The Typereader 3 OCR system consists of a paper-feeding and transport system, a reading and scanning mechanism and a recognition logic unit. According to an A.B. Dick spokesman, the word processor can receive and store the data three ways: background batch mode while an operator continues with other tasks, foreground batch mode so the operator can monitor the transmission and foreground batch mode so the operator can preset special formats or interrupt the transmission when necessary.

Type styles available with the device include letter gothic, prestige pica, prestige elite, courier 72, courier 12, OCR B, hendrix gothic and OCR A. Other features are said to include automatic detection of differences in type style and pitch from page to page through the use of an autofont and autopitch feature and automatic skipping over material such as line art, signatures, equations or charts through the use of a skip/scan feature.

The unit is compatible with A.B. Dick Magna III and Magna SL word processing systems.

It costs $21,400 from A.B. Dick at 5700 W. Touhy Ave., Chicago, Ill. 60648.

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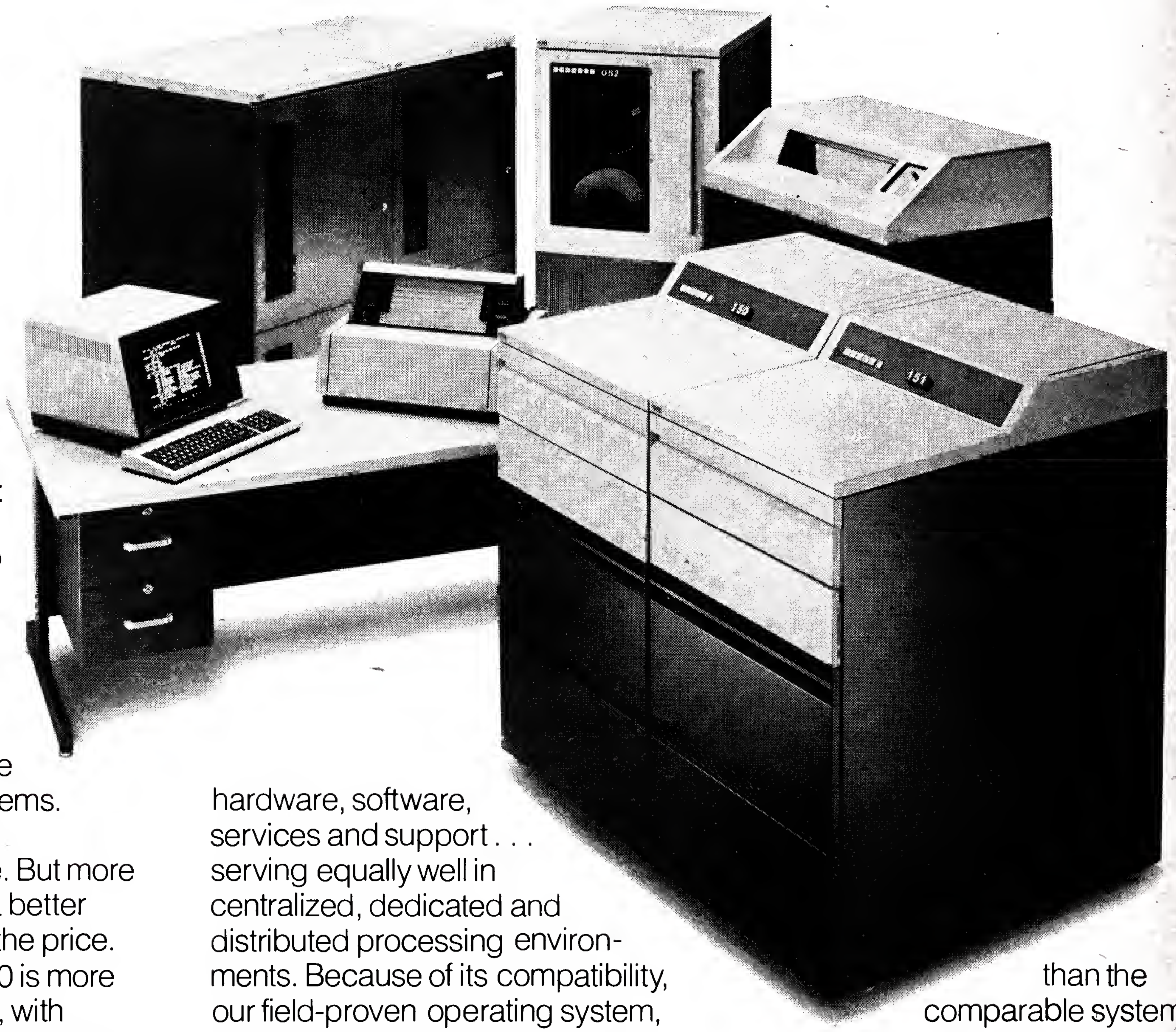

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Intel Enters Systems Mart With Processor

By Marcia Blumenthal
CW Staff

With the introduction of its data base processor recently, Intel Corp.'s Phoenix-based Commercial Microsystems Operation (CMO) has introduced its first "systems" product, which the company promises is the first of many to come.

Although some observers and business press articles contend that by delivering microprocessor-based systems Intel will be competing with its own customers, John E. McNulty, general manager of CMO, refuted that view during a recent interview.

What CMO is delivering by way of the data base processor is a "90-lb component" to which its customers — system houses, computer vendors and large end users — will add personality and host linkup, he explained.

Environmental Software

"If you look at data base management systems [DBMS], 95% of it is managing the data structures and access tools, only 5% is the personality. Our users will build the translator," McNulty said.

By labeling the system "environmental software," McNulty said that CMO is telling its customers not to waste their time developing this type of software, but to put research and development resources into building applications for their end users.

Along the same lines, in about six weeks' time, CMO will introduce a transaction processor that can handle up to 32 users. The first system will be configured to handle about eight users at a cost of less than $10,000 per user, McNulty disclosed.

The data base processor product, in part, is an outgrowth of

(Continued on Page 58)

Major Firms' Earnings Slump, General Stock Price Plunge Follows

By Marcia Blumenthal
CW Staff

Recent announcements by some major computer firms that their earnings will be lower than expected for the first 1982 quarter have caused a general downspin in the prices of computer company stocks during the past several weeks.

Late last month, both Honeywell, Inc. and Amdahl Corp. revealed their earnings would be down substantially for the foreseeable future. Based on those announcements, the price of Honeywell's stock dropped $5.75 in one day, while Amdahl's common stock posted a drop of about $3.50.

"There is a new psychology operating in the marketplace right now," observed Harry Edelson, vice-president of research for the First Boston Corp.

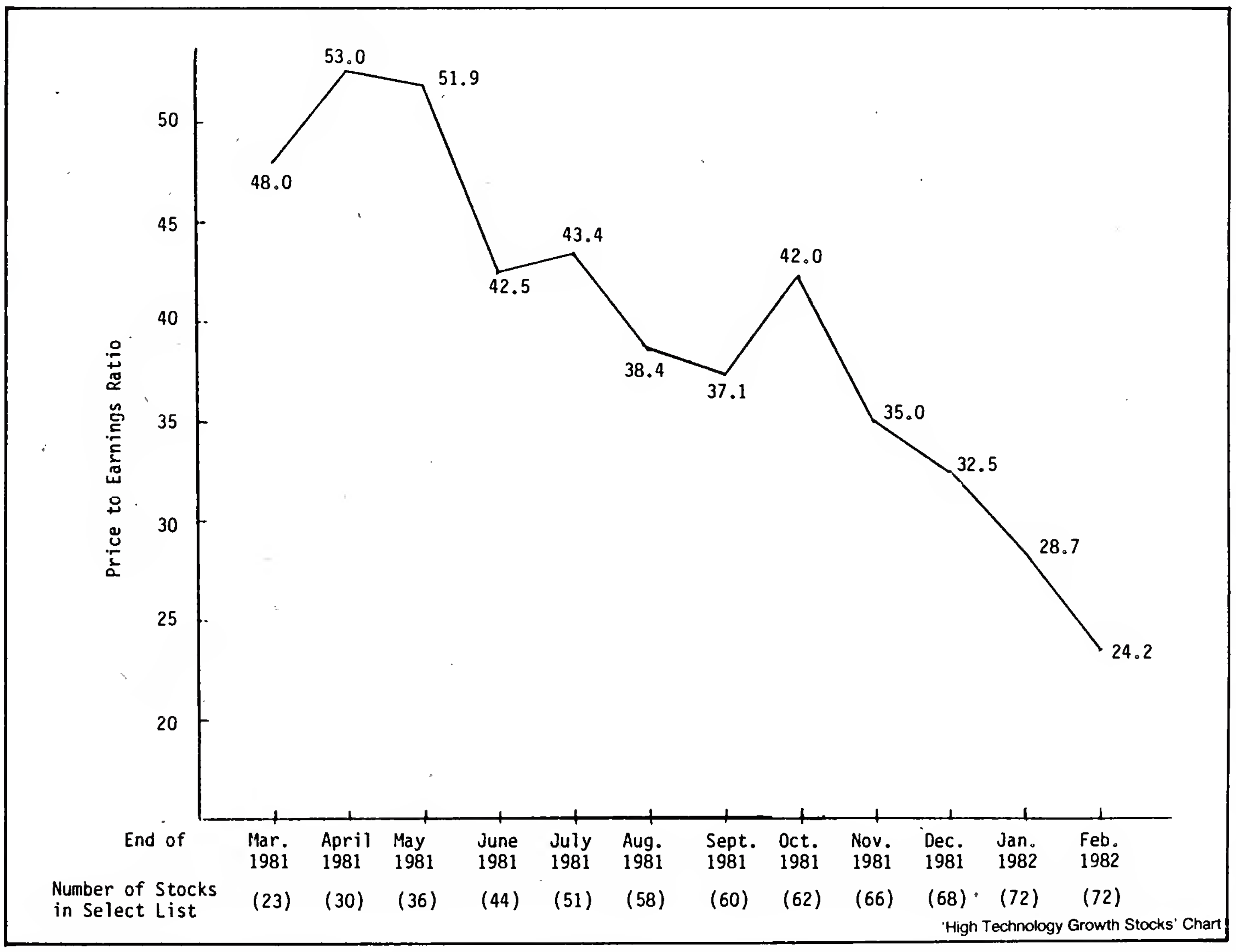
That psychology, in part, is a sympathy movement that was stimulated after what Edelson called the recent market "catastrophes" following lowered earnings prospects announced by Data General Corp. and Datapoint Corp.

By the middle of last month, DG's stock had dropped to about $31.25, down from a price of $50.75 in the middle of February. DG said its earnings would be depressed because of declining European business and flat domestic orders. During the same period, Datapoint's stock price dropped from about $35 per share to $21.50 after the firm announced lower earnings expectations than previously forecast.

Although computer company and high-technology growth stocks have moved downward in recent weeks, the market really bottomed out at the beginning of 1981, Edelson maintained.

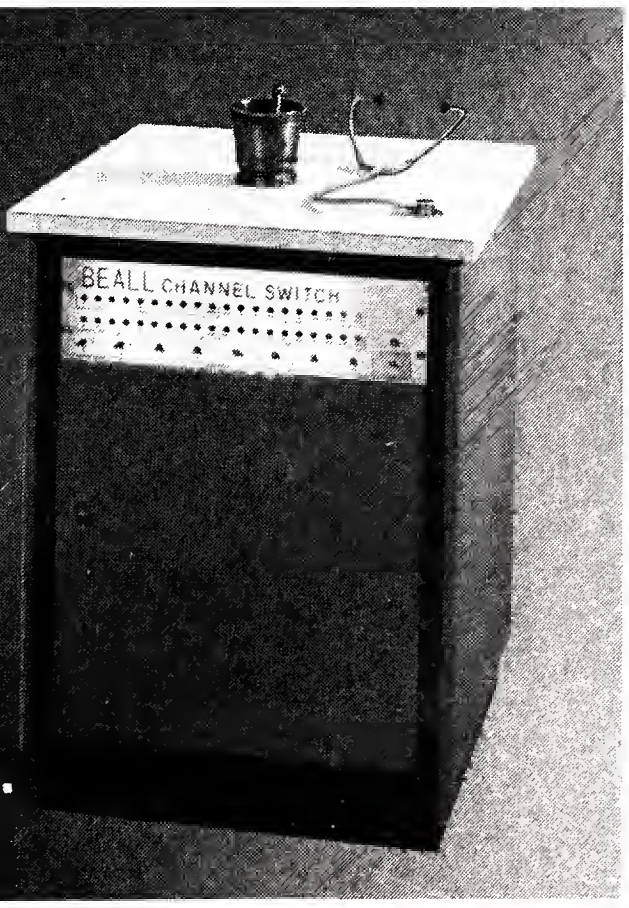
Price earnings ratios for a selected group of high-technology growth stocks have been slashed in half in the past year, noted Bud Anderson, publisher of "High Technology Growth Stocks." His Concord, Mass.-based firm tracks stock prices for 72 high-technology companies, more than 50% of which

(Continued on Page 58)



'High Technology Growth Stocks' Chart

Shown above are the average price to earnings ratio from the end of March 1981 to the end of February 1982 for 'High Technology Growth Stock's' select list of stocks.



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Intel Enters Systems Arena With Processor

(Continued from Page 57)

research done in developing a large-scale back-end processor that was to be used with the firm's System 2000 DBMS software.

In 1979, Intel acquired MRI Systems, Inc., the creator of System 2000. MRI was working on a data base processor, but Intel ditched that project because the cost of the system would have been too great [CW, Dec. 8, 1980]..

However, using its expertise in microprocessor technology, Intel integrated the concepts of the data base processor into a microprocessor-based hardware and software solution. "The concept is the same, but the scale of implementation is much less costly," McNulty said. Intel's data base processor is priced at $9,500 for the board set and $16,000 for the box (story on Page 49).

Few Competitors Seen

Right now, the only competition Intel sees in this arena is from Britton-Lee, Inc. But that firm's data base processor is much larger and has a distinct personality, which removes it from the component level. Intel views its system as a component.

CMO expects to both downsize and upgrade the current data base processor's capability. Ultimately, it would like to get the system down to the chip level. Already its SBC 550, an Ethernet controller board set, has been reduced to the chip level with the introduction of the two-chip 82D2E product.

Although Intel has expanded into the systems area, the firm sees its mix of products — 60% components and 40% board products — remaining constant.

Intel 125% Solution Program Yields New-Products Spate

SANTA CLARA, Calif. —Intel Corp.'s 125% Solution program has apparently paid off in a spate of product introductions that will contribute heavily to 1982 revenues.

During the latter part of 1981, Intel Corp. announced the program, which required the firm's technical staff, data processing managers, engineers, marketing and senior executives to work a 50-hour week with no additional compensation [CW, Nov. 9]. The idea behind the work step-up was to get new products to market as quickly as possible.

This year, some 120 new products will be introduced by Intel, according to John E. McNulty, general manager of the Commercial Microsystems Operation. The firm expects 60% of 1982 revenue to come from new products introduced in the final 1981 quarter and this year.

Earnings Fall, Stock Prices Follow

(Continued from Page 57)

are computer related (see chart page 57).

One dramatic example of the effect of the stock market tailspin is Digital Equipment Corp., which last year posted typically healthy revenue and earnings growth, but whose stock dropped from a high of about $100 per share at the beginning of last year to $75 per share late last month.

What is happening on the stock market is really not a reflection of the economics of the computer industry, according to Ted Costello, vice-president for technical research at Sutro & Co., a San Jose, Calif., investment house. Investors have a tendency to attribute all events that appear less than satisfactory to the economic environment.

A lot of investors are not close enough to industry companies to differentiate between companies that are doing well and those that are in trouble, said Esther Dyson, vice-president of research at Oppenheimer & Co., Inc.

However, in Amdahl's case, lower earnings estimates were made primarily because the firm will not be able to ship its new 580 systems in volume until year-end because of "design changes made very late in the program" coupled with the late delivery of parts from outside suppliers.

Edelson predicted there would be more catastrophes on the market this year. Companies that have had growth rates of 50% or more during the past few years are now dropping into the 20% to 30% growth range, and their stock prices reflect this phenomenon.

From 1979 to 1980, for example, Prime Computer, Inc.'s revenue growth was 75% and earnings growth was 67%, but last year the mini maker's revenue growth slowed to 36% and earnings growth was 17%.

The firm's stock began a downward spiral last summer when it dropped from $49 per share to a recent price of about $19 per share, noted Kenneth Wassman, the firm's assistant treasurer. And that recent price is $4 less per share than shares marketed in mid-February.

Wassman said analysts and investors are awaiting signs of increased order rates at computer companies, a phenomenon that should create renewed interest in investment.

Although DG and Datapoint appear to have spurred a downturn in the market in recent weeks, one observer noted IBM's first quarter earnings could be the biggest potential problem for the stock market. If IBM's earnings are flat, stock prices for computer and technology issues could drop even further.

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Seeks Agreement on Global Basis

Administration Maps Out Trade Reciprocity

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Reagan administration wants to address the question of reciprocal trade on a worldwide basis and not industry by industry, a U.S. trade official said recently, explaining White House opposition to legislation to force government agencies to seek reciprocity in telecommunications trade.

Trade reciprocity, the practice of allowing foreign companies access to U.S. markets only to the extent U.S. firms have access to markets abroad, is one of the hottest legislative issues in Washington at the moment.

The issue received considerable attention at the recent meeting here of the Computer and Communications Industry Association (CCIA).

Steven J. Falken, of the U.S. Trade Representative's office, conceded the U.S. "frequently gave more than we got," in international trade agreements. He assured the CCIA audience, however, that "the administration, as well as this Congress, is listening to your problems in the industry."

Nevertheless, he said, "we want to approach reciprocity on a global basis." He specifically referred to pending telecommunications legislation that would direct the Federal Communications Commission (FCC) to allow foreign telecommunications firms to operate in the U.S. only to the extent that U.S. companies are free to enter individual foreign markets.

The administration does not want to target specific industries or industrial sectors, Falken said, explaining the trade representative's opposition to the legislation.

Raises Questions

The legislation also raises questions with respect to whether an independent regulatory agency — the FCC — should be deciding when to close U.S. markets to foreign competition.

Protecting domestic markets is a broad policy question that should not be left to one agency, according to Falken.

"We have not rejected reciprocity in toto. We can support some measures to strengthen our [negotiating] hand," he said, commenting "it's always nice to have sticks in the closet."

He said the administration is reviewing the numerous and varied reciprocity bills that have been introduced in Congress and promised the White House will support "something that gives us some teeth." The administration may propose a reciprocity bill of its own, he added.

Comments from the audience indicated strong support for the telecommunications reciprocity proposals, but Falken would only promise to work for more openness in telecommunications trade through established negotiating mechanisms.

"It seems like things move very slowly," in such negotiations, Falken said, but he suggested the Japanese telecommunications market is just opening up to U.S. firms and that the government expects a favorable outcome to its long years of negotiation there.

CCIA President Jack Biddle asked Falken if the telecommunications and computer industries are suffering in Washington from a failure "to organize ourselves and put political heat on" legislators and negotiators.

Falken replied that political clout through organization "is the name of the game in this town." He pointed out that the agriculture industry has long had very influential Washington representation both within Congress and from industry lobbyists.

Whereas agriculture is represented at the Cabinet level, he added, telecommunications and computer industry matters are concentrated in a few small government agencies.

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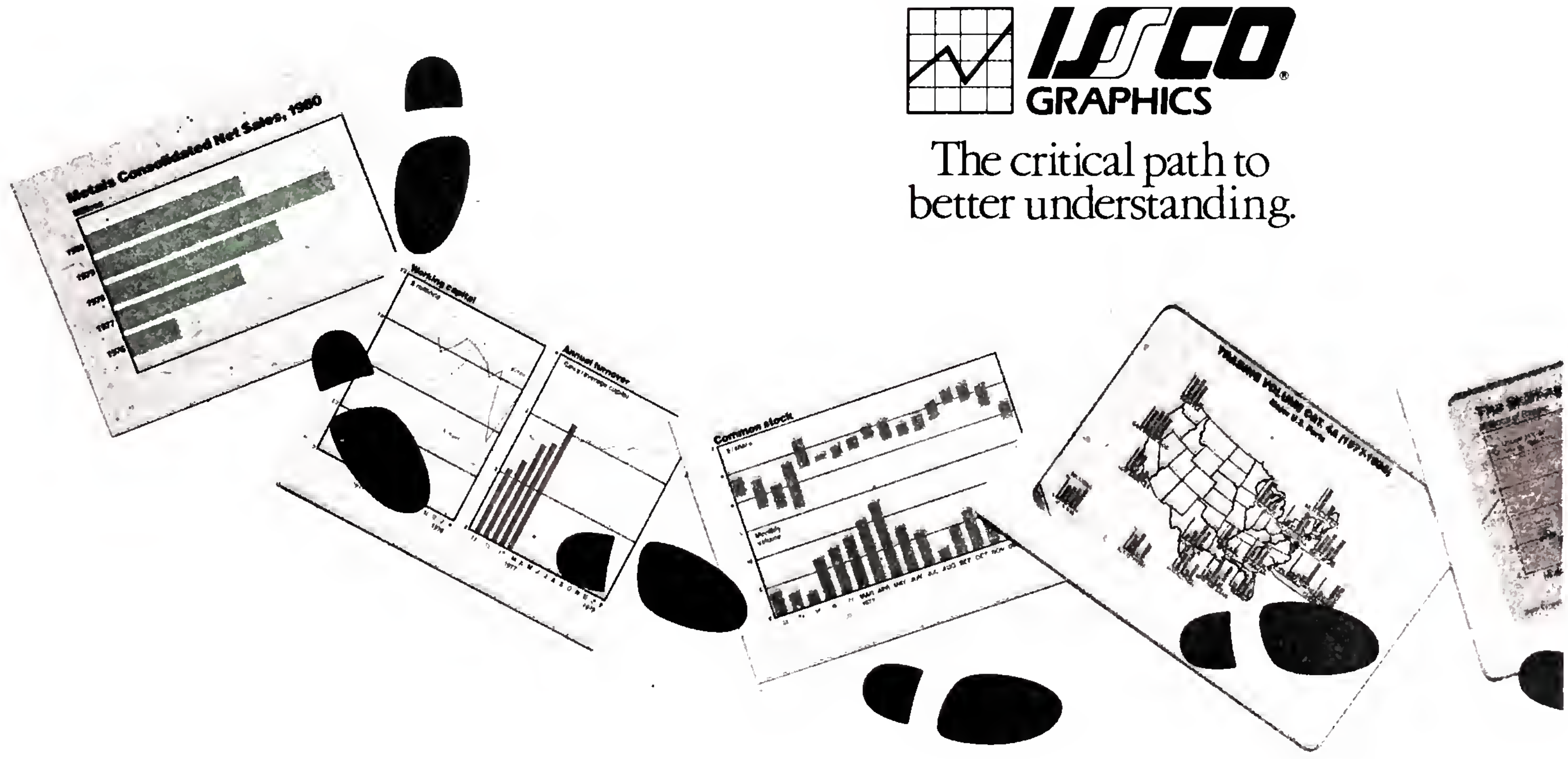

Japan Offered IBM Datamaster

TOKYO — IBM will sell its System/23 Datamaster in Japan through 15 independent dealers.

About 150 dealers applied to sell this product, but IBM Japan selected only 15 for the first phase of the program. These third-party dealers will provide system engineering while IBM will maintain the products.

Dealers are free to set their own prices for the product, according to the vendor.

Although dealers expressed interest in selling larger systems such as the System/34, System/38 and 4300, IBM was unresponsive to this request.

DG Ups Interest in Japan Venture

WESTBORO, Mass. — Data General Corp. has increased its ownership interest in its Japanese joint venture from 50% to 85% through the exchange of 80,000 shares of its common stock.

DG said the acquisition will be accounted for as a purchase starting with its third quarter, which began this month. The transaction will have no material effect on DG's operating performance, the firm added.

Revenues of $34 Million

Nippon DG reported revenues of about $34 million last year. The company employs about 550 people in engineering, manufacturing and sales and service.

Nippon DG builds and markets the full line of DG computers and has devoted a significant portion of its research and development capabilities to designing new products such as Kanji character terminals and software aimed at the specific demands of Far East markets, DG President Edson D. de Castro noted.

Foreign Orders & Installations

Techexport, Inc. has received an order for 90 Intelligent Systems Corp.'s color graphics systems for delivery to the Nigerian Telecommunications Authority.

Telefile Computer Products, Inc. has installed its T-81 computer system at South African Airways.

Amfas Groep, a Netherlands insurance company, and Electronic Data Systems Corp. signed a $25 million five-year computer services contract in Rotterdam recently.

Lundy Electronics & Systems, Inc. has received a $1,575,000 order from the Instituto Nacional de Hipodromos, a Venezuelan organization based in Caracas. The contract calls for Lundy to deliver turnkey systems including L7200 optical character recognition document readers and software programs for processing national lottery tickets.

The Royal Hong Kong Police ordered a dual 32-bit superminicomputer system valued at $1.2 million from Perkin-Elmer Corp.

The New York Times Information Service, Inc. and Info Globe — a division of *The Globe and Mail,* Canada's national newspaper — have reached an agreement in principle in which the information service will undertake U.S. marketing of the data bases produced by Info Globe. Info Globe will become the exclusive Canadian marketing agent for the data bases.

Altergo Software Ltd., the UK parent company of Boston-based Altergo Products, Inc., has won an $8 million software order from the Hungarian government. The order is for systems software, which will be used to improve the operating efficiency of most of the Riad System and IBM mainframe computers installed in government, commerce and scientific research.

Expansions

Intel Corp. is purchasing 239 acres in Folsom, Calif., to be used for future expansion.

Shugart Associates, Inc. plans to manufacture its floppy disk drives at a 250,000 sq-ft facility in Lille, France, later this year.

An integrated-circuit manufacturing facility near Natural Bridges State Park in Santa Cruz, Calif., has been opened by **Synertek, Inc.**

Policy Management Systems Corp. recently broke ground for the construction of its $5.2 million computer center, which will house all of its computers, related equipment and data services personnel.

Xidex Magnetics, a subsidiary of **Xidex Corp.,** announced completion of a 25,000 sq-ft facility in Santa Clara, Calif., for assembling and testing precision flexible disks in anticipation of the company's entry into the floppy disk market later this year.

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Then our NCC Show Issue comes out June 7th, the day of the show. It will have last-minute show information, speech previews and other show details. Pick up a copy at the *Computerworld* booth. Black and white ad close is May 27th*. Color close is May 21st.

Finally, our June 14th NCC Wrap-Up Issue will have complete coverage of all that happened, prepared by our 35-person editorial staff. You'll read who said what, who introduced what and how it works, and review the show's features and highlights in words and pictures. Black and white ad close is June 4th. Color close is May 28th.

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French Technocrat Notes

Telematique Subsidies to Boost French DP

By Brad Schultz
CW New York Bureau

LOS ANGELES. — The greatest threat to the U.S. computer industry may reside across the Pacific, but another strong rival will in a few years be found across the Atlantic, where the new socialist administration of French President Francois Mitterand now emulates "Japan, Inc." by funding the domestic information processing industry of France.

In a recent interview, Dominique Eustache, assistant director of the French Industrial Development Agency (Fida), said that French manufacturers of "telematique" equipment will receive government subsidies of $250 million each year. "Telematique" refers to a broad range of computing, telecommunications and office automation products and services.

Mitterand's predecessor, Valery Giscard d'Estaing, began a national telematique program that called for installation of data terminals in millions of French homes during the 1980s.

Paradoxically, the French government has been receptive to the presence of U.S.-made computer technology in France, Eustache indicated.

This move is designed to allow the French computing community to acquire the resources and experience necessary for a rise to world leadership. Morever, currently about 80% of France's computer-stored data is processed by U.S. companies, he declared.

Cashing in on French Market

To cash in on the French market for computer-related products and services, which has grown at a compounded annual rate of 25%, nearly all major U.S. vendors have branch offices or affiliates in the country, Eustache noted. Last year, he said, 26 U.S. companies invested $2 billion in French business; nearly half this amount went to trade in electronics, including DP.

Nevertheless, France is second only to the U.S. among nations as a supplier of software, the Fida official maintained. IBM continues to dominate computer sales to France and Europe as a whole, he pointed out. But France captured a 20% share of the European telematique market in 1978 and will have a 30% share this year, he added.

Against the U.S. and Japan, France is likely to compete more effectively in software than hardware and more effectively in small systems than large systems, Eustache observed.

Among U.S. vendors that have escalated sales campaigns in France, Tandy Corp. recently struck a deal with Matra S.A. (a French high-technology conglomerate) to market microcomputers in the TRS-80 class jointly.

The telematique program was begun shortly after the French government recognized that France had one of the world's worst telecommunications systems, Eustache remarked, and is aimed at establishing one of the world's best.

Along with a number of European nations, France has enacted legislation that limits concentration of information about individual citizens in computer-stored data bases. Such legislation — much of it addressed to flow of data across national borders — is officially described as privacy protection, but has been criticized as impeding trade between U.S. companies and French consumers.

Magnuson Gets $5.2 Million By Issuing Preferred Stock

SAN JOSE, Calif. — Magnuson Computer Systems, Inc. has raised $5.2 million in new equity from private investors through issuing convertible preferred stock.

These preferred shares can eventually be converted into approximately 4.5 million shares of Magnuson common stock. Currently, the firm has about five-million common shares outstanding.

The company, which has experienced a downslide in recent months, will use the funds for working capital.

In addition, the firm reported it had obtained a revised credit arrangement with the Bank of America N.T. & S.A. The new agreement allows the company to convert its present indebtedness into a new two-year commitment consisting of a revolving credit line of $4 million and a term note of approximately $16 million. Under the agreement, the bank has received a warrant to purchase approximately 472,000 shares of common stock for $1.17 per share.

New Companies

N. Dean Meyer and Associates, Inc. is a newly established research and consulting group focusing on the "people issues" of automation. The firm is located at 233 Mountain Road, Ridgefield, Conn. 06877.

Kritzer Associates is a new firm specializing in consulting services to the computer industry in matters relating to U.S. export licensing requirements. It is located at Suite 102, 4982 Sentinel Drive, Bethesda, Md. 20816.

Iconographics, Inc. is a new company offering services in computer graphics and image-based technology for micro- to medium-scale systems. The company is located at 3022 Graham Court, Falls Church, Va. 20042.

Rising Star Industries is a new affiliate to **Epson America, Inc.** The company specializes in product and software development and market research. Chris Rutkowski, Epson manager of market research and development, has been named president. The company is located at 3415 Kashiwa St., Torrance, Calif. 90505.

Applied Spectrum Technologies, Inc. is a new firm that will market products utilizing its patented spread-spectrum technology base. It is located at 450 Industrial Blvd., Minneapolis, Minn. 55413.

Data Communications Brokers, Inc. is a new company specializing exclusively in equipment from computer interface to terminal interface. Russell A. Straayer has been named president. The firm is located in Champaign, Ill:

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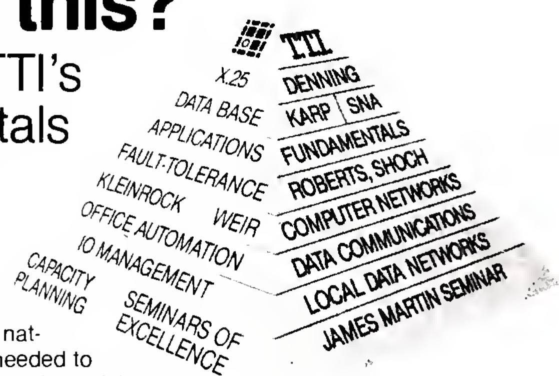

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STC Creates New Position, Appoints President

LOUISVILLE, Colo. — Storage Technology Corp. (STC) announced a change in its organization last week, creating a separate position of president.

Until now, the firm's chairman and chief executive officer — Jesse I. Aweida — has also served as the firm's president.

Promoted to the new position of president and chief operating officer is Naim S. Aweida, brother of Jesse Aweida, who has been with the company since 1969. Aweida was previously executive vice-president of field operations.

Aweida's responsibilities will include engineering and manufacturing operations, marketing and sales, field engineering operations support, human resources and two new functions: business program management and operations analysis and control.

Three additional promotions were also announced: Russell B. Drew to vice-president of worldwide marketing and sales from vice-president of domestic sales, William Mansfield to the new position of vice-president of business program management from vice-president of OEM sales and Philip A. Ingalls to vice-president of OEM sales from division vice-president of marketing.

Other Appointments

- Joe B. Freeman Jr. has been elected president, chief executive officer and director of AM International, Inc. following the resignation of Richard B. Black as chairman, president and chief executive officer.
- Howard W. Smolanoff has been appointed president of Bradford Data Services, a division of Bradford National Corp.
- Sergio Ferragut has been named president of Cullinane Mexicana, the Mexican subsidiary of Cullinane Database Systems, Inc.
- Robert M. Resnick has been named president of Edutronics/McGraw-Hill. He also continues as general manager.
- J. Garrett Fitzgibbons has been elected president and chief operating officer of Baron Data Systems.
- Edwin L. Hughes has been appointed president and chief operating officer of Florida Data Corp.
- David F. Horton has been appointed president of Intertel, Inc. He replaces Intertel's founder, Jerry L. Holsinger, who remains chairman of the board and who has become vice-president of engineering. C. David Hetrick has been named vice-president of marketing and W. Harry Vickers assumes the position of vice-president of corporate development.
- Susan R. Cippele has been appointed to vice-president of finance for Carterfone Communications Corp.
- Donna M. Zaller has been named vice-president of marketing services for SMC Proprietary Systems.
- Russell Krapf has been appointed vice-president and general manager of the Rigid Media and Components Division of Memorex Corp.'s Media Products Group. Lawrence Chamberlin has been appointed vice-president of human resources, and Foster A. Markolf has been appointed vice-president of legal for Memorex.
- L. Stanley Coffee has been named vice-president of sales for Advanced Electronics Design, Inc.

Executive Corner

- Martha E. Donovan has been appointed vice-president of personnel, and Robert S. Joseph has been named vice-president of marketing and sales/service at Computer Devices, Inc.
- Roger A. Smullen has been appointed vice-president and general manager at Applied Micro Circuits Corp.
- Irma M. Wyman has been appointed vice-president of corporate information management, and Thomas E. Moore has been promoted to vice-president of strategy and planning for information systems at Honeywell, Inc. Vice-presidents George Spell and Russell G. Henderson have retired from the company.
- David Graft has been appointed vice-president of systems and Irwin M. Scarano has been appointed vice-president for finance and administration and chief financial officer for Summagraphics Corp.
- Richard Duddy, James Sheaffer and Betsy Walker have been named vice-presidents for American Management Systems, Inc.
- Dallas Talley has been appointed executive vice-president and chief operating officer of MDS Qantel, Inc., a Mohawk Data Sciences Corp. company.
- Evan M. Gruber has been named vice-president of finance for Computerized Restaurant Systems, Inc., a corporation of Applied Technology Ventures.
- Charles M. Parker has been appointed vice-president of marketing for LeMans Group, Inc.
- James H. Potter has been appointed executive vice-president and chief operating officer of Insurance Systems of America.
- Ronald S. Dobies has been elected vice-president of sales and Thomas H. Frahm elected vice-president of corporate development for Astrocom Corp.
- Victor V. Vurpillat was recently named vice-president of research and development for Safeguard Business Systems, Inc.
- David M. McWherter Jr. has been named vice-president of engineering for Franklin Computer Corp.
- Richard B. Aldridge has been appointed vice-president of computer and network operations, and Richard G. Taylor has been named vice-president of marketing at Martin Marietta Data Systems.
- Michael Perez has been appointed vice-president of finance and administration for Information Management International.
- Robert L. Walker has been appointed vice-president of computer systems for Associates Bancorp, Inc., a subsidiary of Associates First Capital Corp.

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With a 66% increase in revenues and an 89% increase in profits this fiscal year, **Cullinane Database Systems, Inc.** is the most respected and financially successful company in the computer software industry. A user driven company whose products have been rated #1 by an enthusiastic user base, **Cullinane** has the following opportunities available.

SYSTEMS SOFTWARE DEVELOPMENT

Requires creative highly motivated professionals with extensive background in systems programming or control systems software development. Results-oriented customer responsive environment. Development openings are within the following groups:

- **Database • Data Communications**
- **Integrated Data Dictionary**
- **On-Line Query • Audit-Retrieval**
- **Application Development System**

ON-LINE PRODUCTS/ TECHNICAL SUPPORT

Provide technical support to customers via telephone. Requires proven ability and desire to interact effectively with customers. One or more of the following desirable: 3-5 years' experience in systems programming; background in database systems such as IDMS or IMS; experience with on-line systems such as IDMS/DC or CICS; extensive Assembler required; experience installing and maintaining BTAM, VTAM or TCAM desirable.

GENERAL LEDGER SYSTEM/ TECHNICAL SUPPORT

Will provide technical support via telephone to users of general ledger system. Requires proven ability and desire to interact effectively with customers. Extensive background in accounting, ability to communicate within accounting industry, and minimum 3 years' data processing experience required. Familiarity with **Cullinane** products, general ledger applications and knowledge of COBOL highly desirable.

APPLICATIONS SOFTWARE DEVELOPMENT

Requires senior level (minimum 3-5 years) experience in design, development and implementation of financial (general ledger, A/P, A/R, etc.) or manufacturing applications. Database background essential. Project leadership experience desirable. Good communication skills and ability to work independently.

TECHNICAL FIELD SUPPORT

Northeast Region

To install products, provide training, and phone or on-site support to current and prospective customers. Requires experience within an IBM mainframe environment and background in programming, DB/DC administration, or systems.

QUALITY ASSURANCE ANALYSTS

One position involves testing and auditing of software documentation, and training materials for on-line products. Requires COBOL, Assembler and/or PL/1 experience in an on-line database environment. DOS experience a plus and good language skills important. A second position involves test installs of our new control and application software products prior to release to provide documentation for the products.

COURSE DEVELOPER

Will design instructional programs and materials for our software products. Requires experience in designing training programs for industry/business. Ability to research, organize, and communicate technical information. Demonstrated knowledge of programming, computer operations or applications.

SOFTWARE TECHNICAL WRITERS

Requires solid grasp of basic data processing concepts. Work closely with development staff overseeing each document from design through printing. Assignments will be in the areas of audit/retrieval, database, data communications, financial, manufacturing, and banking applications. Familiarity with IBM operating systems a plus. Access to on-line text entry and editing facilities available to each writer. Include writing sample with resume.

PRODUCT MARKETING

Requires extensive experience in sales/marketing of manufacturing software systems and thorough knowledge of manufacturing environment. Will develop and implement marketing programs and provide pre/post sales support. Responsible for product presentations to prospects, sales organization and internal staff. Excellent communications and presentation skills essential.

For the preceding positions, qualified candidates should send resume to Susan Lasovick, Personnel Administrator, **Cullinane Database Systems, Inc.,** 400 Blue Hill Drive, Westwood, MA 02090.

PRODUCT MANAGEMENT

Requires expertise in one of the following: database systems, teleprocessing monitors, on-line application development systems, or manufacturing systems. Will interact with development, documentation, education, and field groups to coordinate planning and implementation of new products and releases. Will also provide technical marketing support. Strong communications and presentation skills required.

MIS DEVELOPMENT

Requires 3 or more years' applications experience using COBOL or other high level language in a database on-line environment. Will develop applications for use internally. Good communication skills and ability to interface with users.

MANUFACTURING SALES REPRESENTATIVES

As we expand our market base, we need professionals with a proven track record in manufacturing software sales. DP or technical background preferred, but not necessary. APICS certification helpful. Positions available nationwide.

MANUFACTURING FIELD SUPPORT

Qualified candidates will have 3-5 years programming experience in an on-line environment; strong manufacturing applications experience and IDMS or other database background is required.

AUDIT/RETRIEVAL SALES REPRESENTATIVES

We are seeking individuals with strong EDP auditing background to join our marketing staff. Responsibilities include ongoing development of a defined territory, producing new accounts and managing existing clients. Sales experience is a plus, but not necessary. Opportunities are available in major cities nationwide.

For the preceding positions, qualified candidates should send resume to Roy Evarts, Employment Manager, **Cullinane Database Systems, Inc.,** 400 Blue Hill Drive, Westwood, MA 02090.

Database Systems
Cullinane
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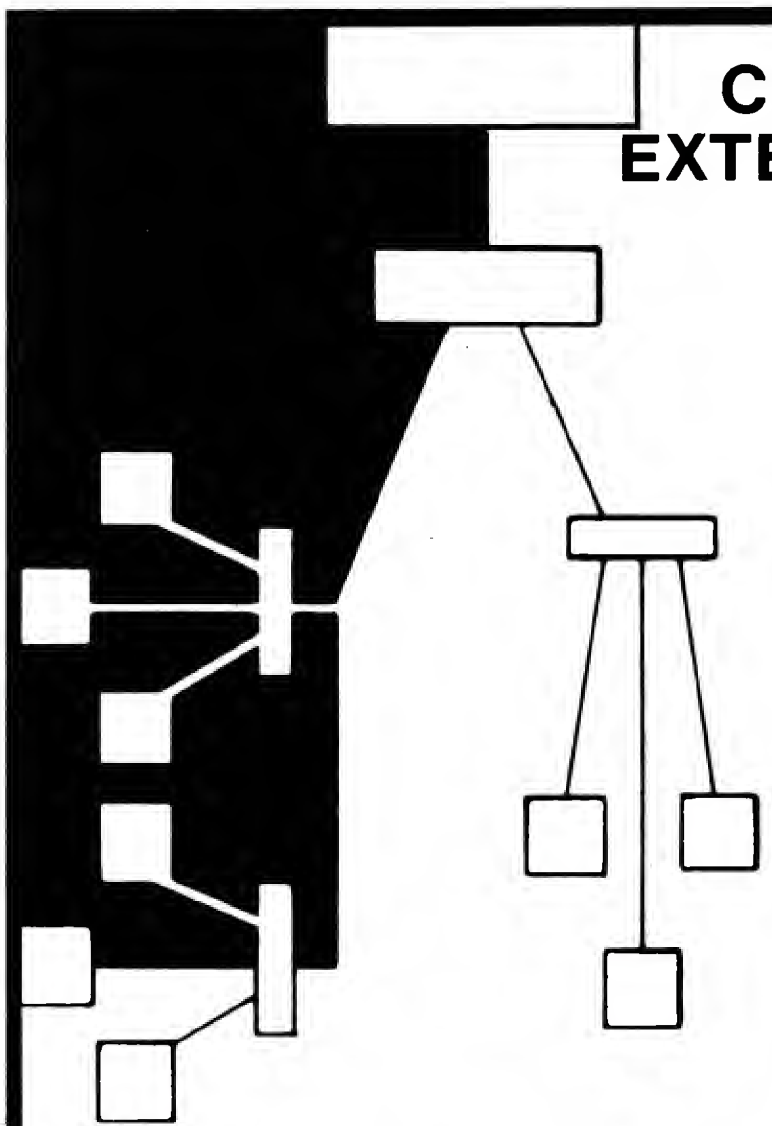

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- Lead the design and development of software subsystems in a real-time PASCAL environment. Requires previous design responsibilities, 4 years real-time software experience, and PASCAL or other block-structured language. 8S or MS in Computer Science or EE required. Telecommunications background desired.
- Develop functional program specifications, test plans and code for microprocessor-based (Z80, 8086) communication's concentrator. Will develop new protocol modules within our new products. Requires 5-7 years experience in Assembly language with some in a high level language. Degree in Computer Science or related field essential.

SYSTEM DESIGN ENGINEER

Responsible for the design and support of new and future hardware and firmware projects. Requires 2-3 years design experience with microprocessor systems, memories and peripheral LSI chips. Programming exposure, use of emulators and development systems, and Z80 and/or 8086 experience a plus. 8SEE or 8S in Computer Science required.

SENIOR TEST ENGINEERS

Will design test programs for microprocessor-based systems or functional ATE equipment. Requires 5-7 years experience and familiarity with 8080 microprocessor and its family of support chips. BSEE or equivalent essential.

SENIOR NETWORK ARCHITECT

Will report to the Director of Future Product Planning. Requires a general understanding of systems architectures defining software structures. Experience in the implementation of a real-time multi-tasking software structure required. Exposure to different switching techniques, detailed knowledge of standard communication protocols and an understanding of modems essential.

SENIOR MECHANICAL ENGINEER

Develop highly producible packaging concepts for commercial telecommunications applications. Requires 8SME or equivalent and 5-7 years experience designing electronic cabinets to meet UL, CSA, VDE and FCC EMI requirements.

SENIOR TEST TECHNICIANS

Perform digital troubleshooting of MSI and LSI device-based communications equipment and/or ATE testing. Requires 3-5 years experience, plus background in Assembly language and logical analyzer operations and architecture. AA in Electronics is an asset.

Amdahl offers an attractive salary, benefits and growth program for motivated professionals. For immediate consideration, please forward resume or call J. Keller (213) 822-3202. Outside California call 800-421-2331.

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And when professional software engineers gain this kind of experience, everyone – their colleagues, their supervisors, their companies and their industry – benefits.

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For more information, call Cynthia Johnson, Corporate Liaison, at (617) 649-9731, or mail the request below.

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We offer an excellent salary, full company paid benefits and advancement opportunities. Send your resume, including salary history, in confidence, to: **Mr. Al Cipollone, Value Computing Incorporated, 498 N. Kings Highway, Cherry Hill, NJ 08034.** EOE

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AA/EOE

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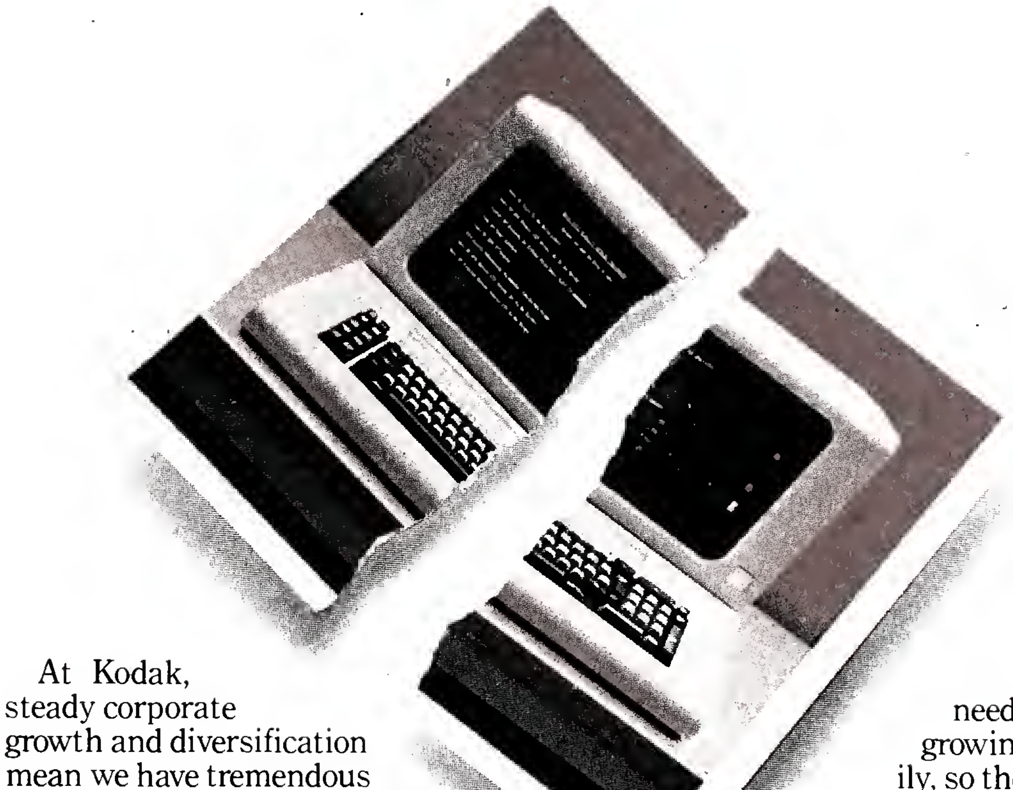

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If you think you'd thrive facing the daily challenges you'll find at Kodak, call us toll-free at (800) 828-6541; or, if you live in New York State, call us collect at (716) 724-4605. Or send your resume to: Personnel Resources, Eastman Kodak Company, Dept. C-82 Rochester, N.Y. 14650.

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- Three years experience in the maintenance functions of the MVS operating system including SYSGEN, SMP, problem response, product maintenance and BAL programming and debugging.
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(617) 725-6609 8am to 4pm

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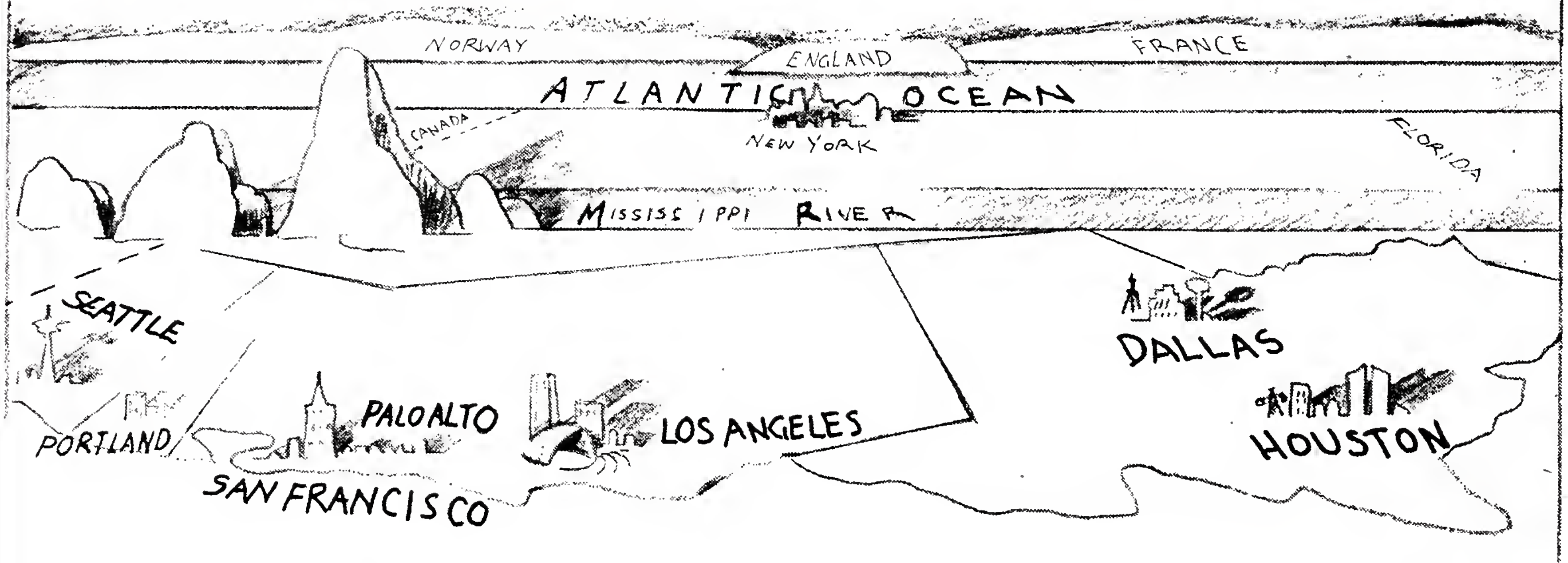
THE DP WORLD



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2. Code and debug assigned routines.
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CLOSING DATE: The last day to apply will be April 15, 1982. This position will be for September, 1982.

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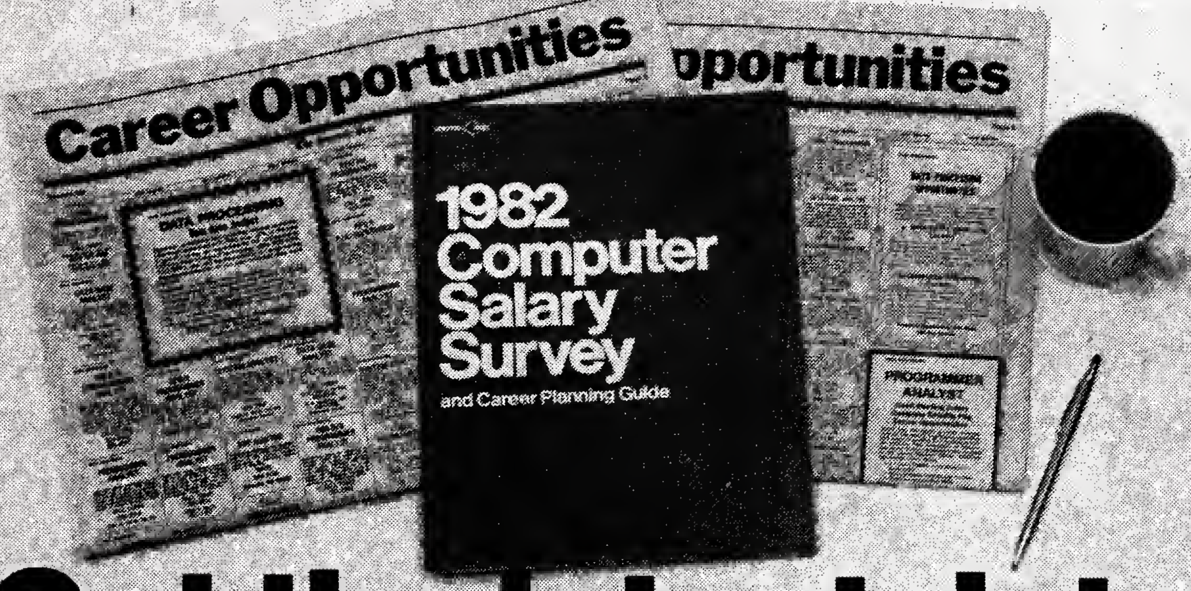

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With compensation rising rapidly and sweeping technological changes occurring practically overnight in the computer profession, you can quickly become out-of-touch with salary and career trends. Are you—and is your salary—keeping up?

If you haven't kept in touch with computer salaries in the past six months or so, you might be surprised at the changes.

In our recent Survey, which polled more than 50,000 computer professionals, new statistics about compensation differences emerged. Here is a sampling:

- While some computer professionals have increased their salaries dramatically during the past twelve months, others, performing the same type of work and having the same general level of experience, have barely managed to keep pace.
- While length of experience in computing bears a direct relationship to compensation, type of experience is often a more critical factor.
- Some emerging technologies—microcomputer systems, for example—are having an unusual impact on compensation in the field.

Salaries for 48 positions are compared.

1982 salary data for 48 different position categories—at various levels of experience and computer installation sizes—are reviewed in the report. Included are positions in programming, software, systems design, data communications, mini/micro systems, data base, EDP auditing, computer marketing and more.

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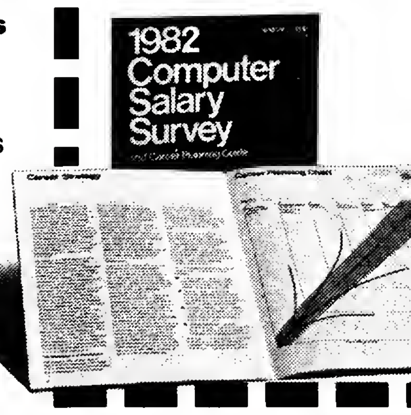

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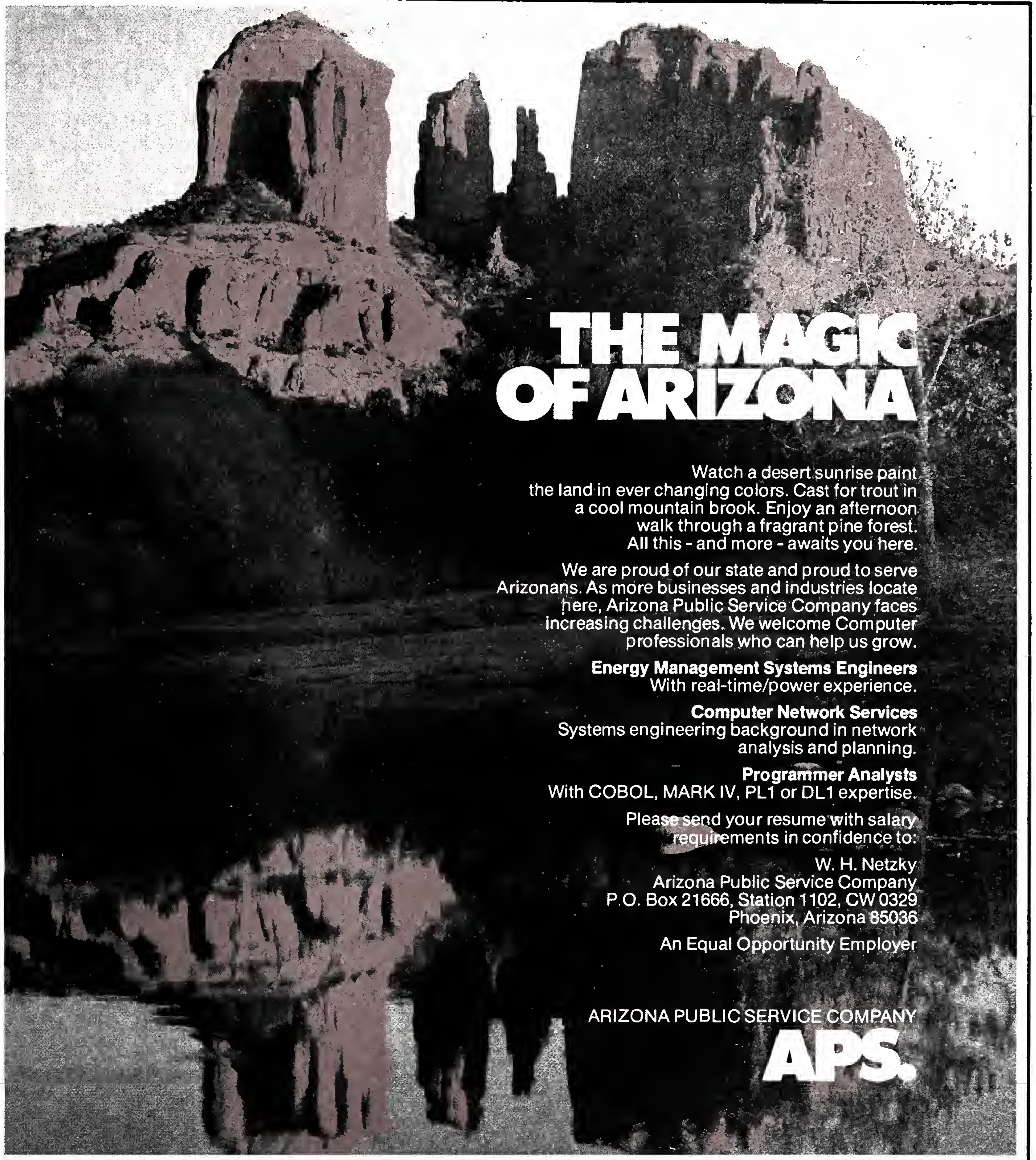

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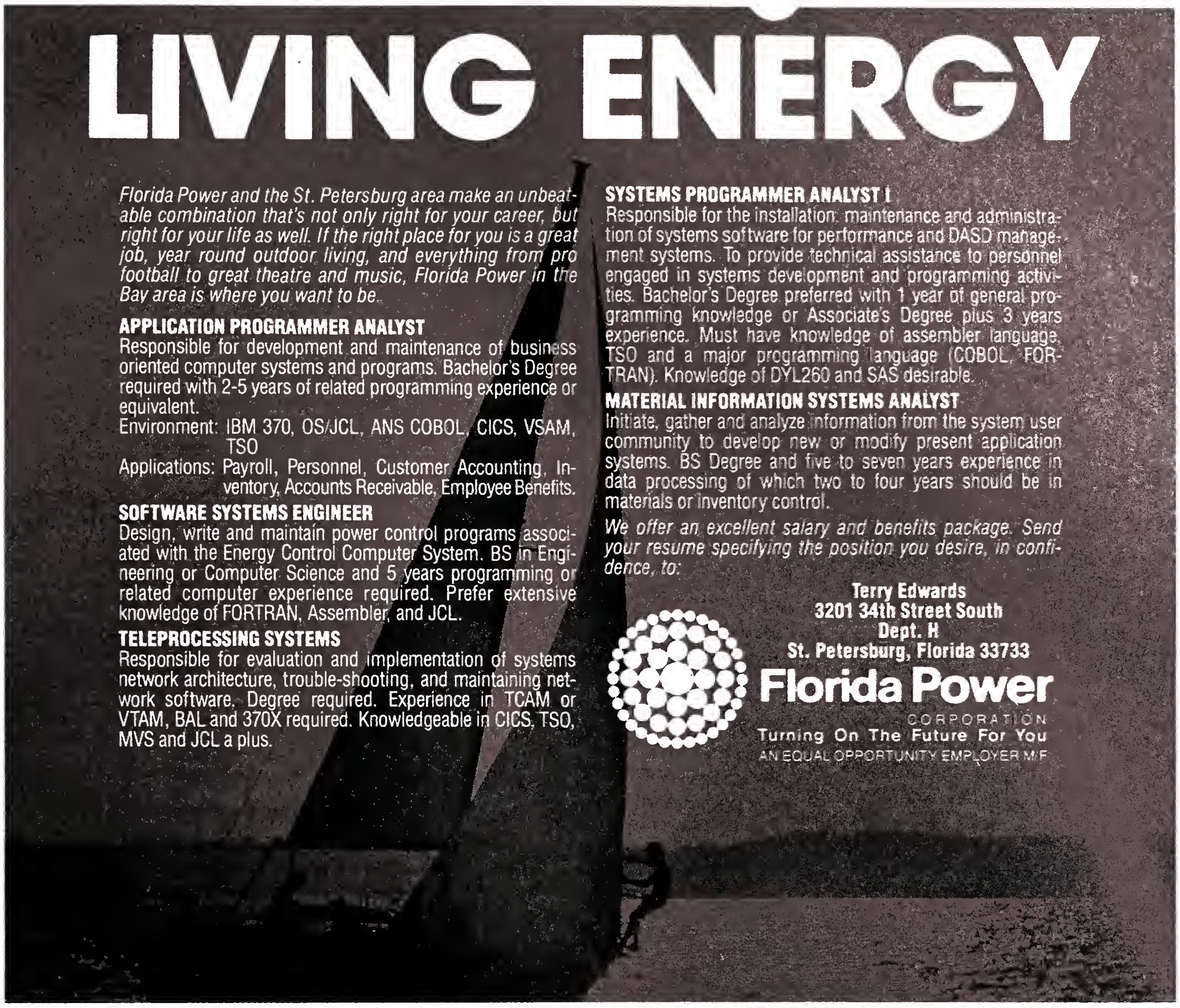

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EOE M/F/H

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Millersville State College is soliciting applicants for a tenure-track position in Computer Science for the year beginning September, 1982. A Ph.D. is preferred, but an M.S./M.A. in Computer Science acceptable. Teaching experience is required with additional business computing experience desirable. More than 10% of the college's 4500 students major in the Department of Math and Computer Science, Applied Math, Liberal Arts Math, and Math Education. A strong committment to teaching excellence is required, together with a keen interest in recent developments and trends in the field.

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Reply by April 1, 1982, by sending transcripts, and three letters of reference to:

Mr. Robert S. Shaak, Chairperson
Department of Math and Computer Science
Millersville State College
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Aims Community College
Personnel Office
P.O. Box 69
Greeley, CO 80632

Deadline date for receiving applications is: April 23, 1982.

EOE/AA

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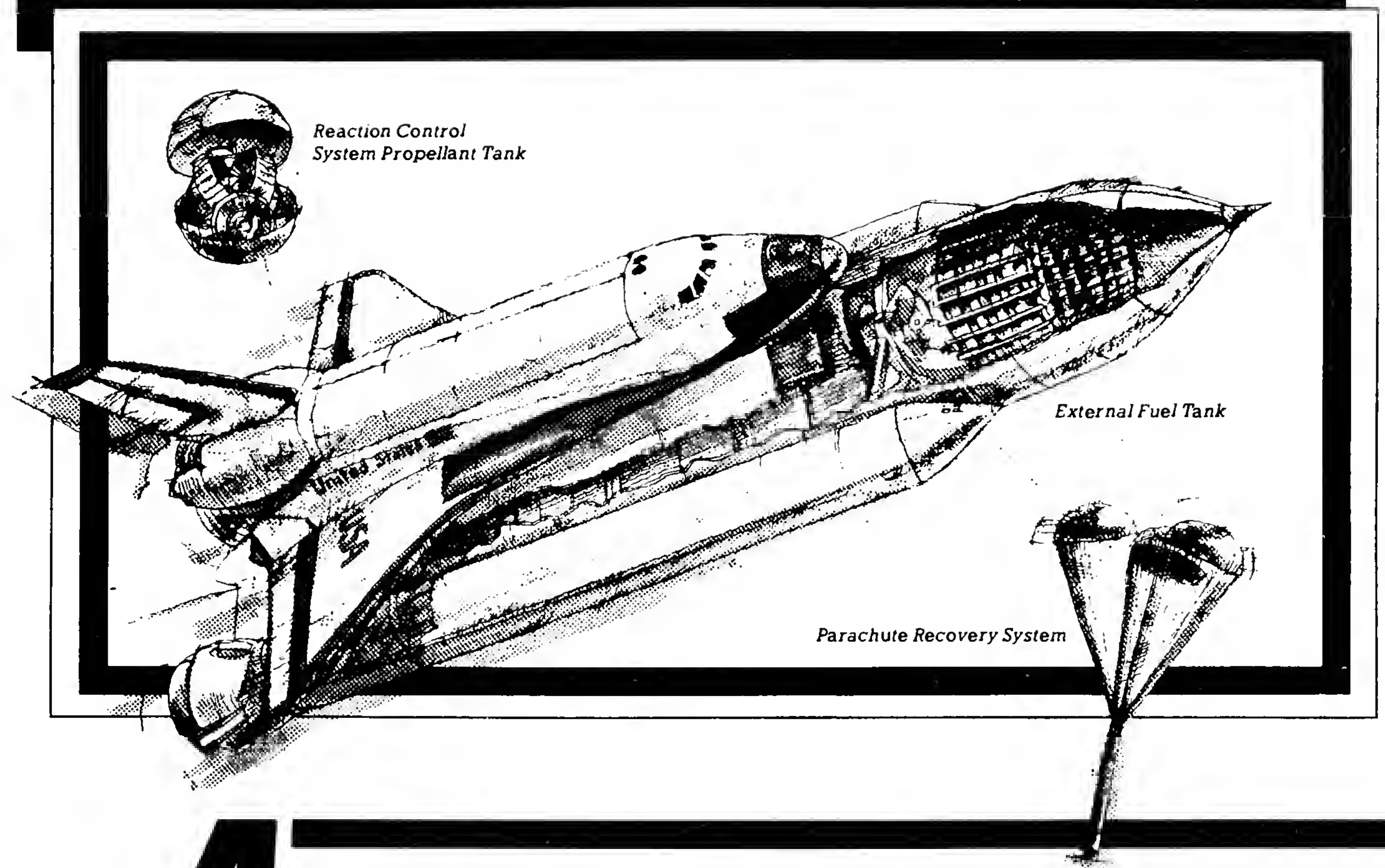
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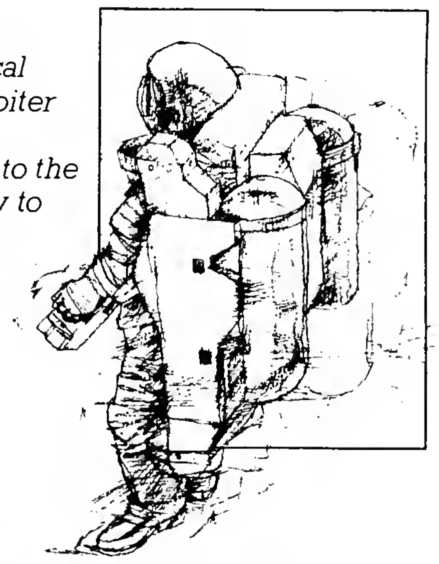

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(305)948-6900

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University of Nevada
System Computing Center

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Application, resume, and three letters of reference should be directed by April 23,1982 to :

Dr.LLoyd Case
Chairman Search Committee
UNS COMPUTING CENTER
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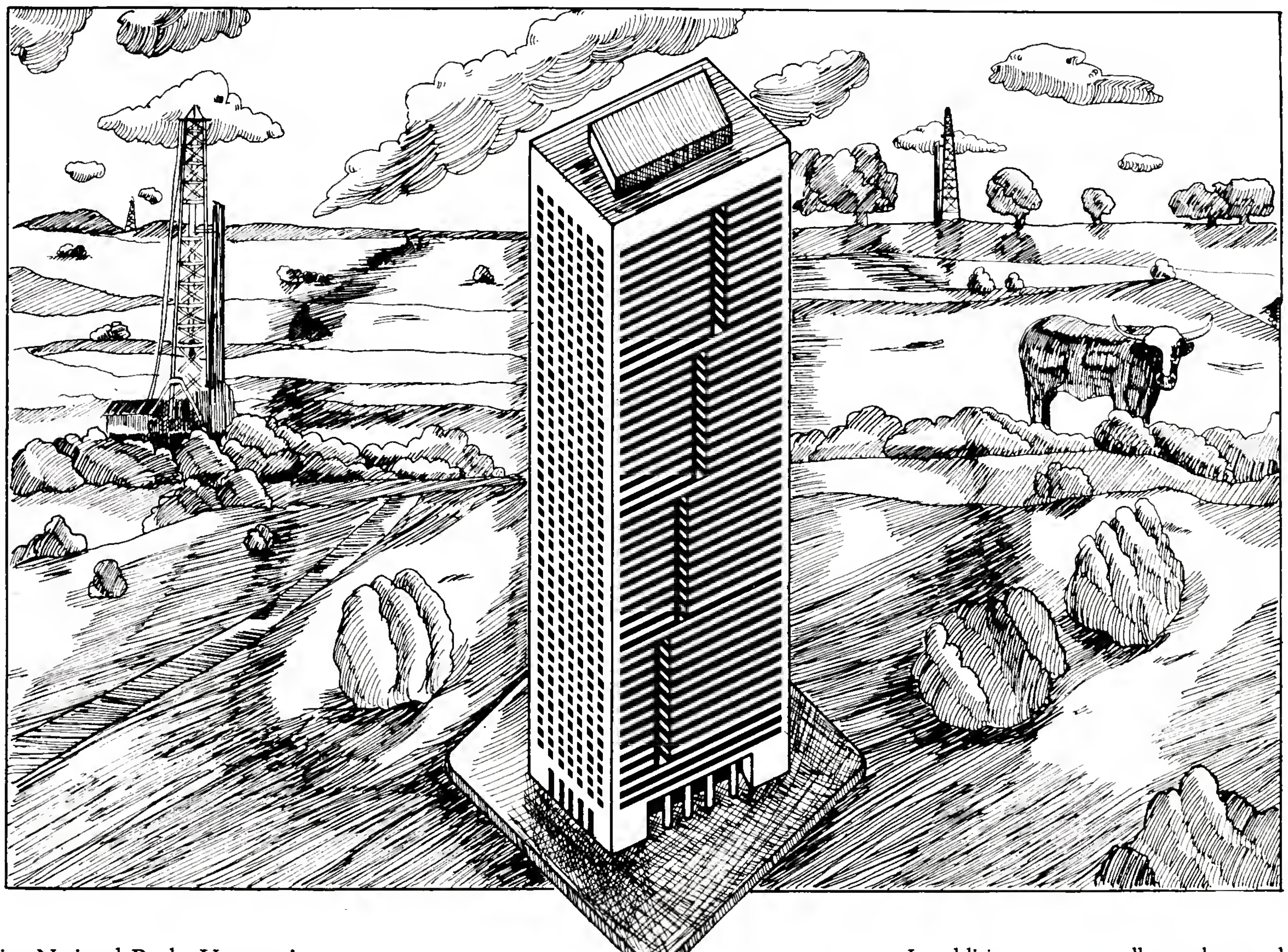

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$18,886-$25,750/Annum
Salary negotiable

Four year degree in computer science, business admin. or accounting + 3 years responsible experience required in systems design. Programming and PDP-11 minicomputer experience desired. Apply to: **City of Largo, P.O. Box 296, Largo, FL 33540** by 4/5/82.

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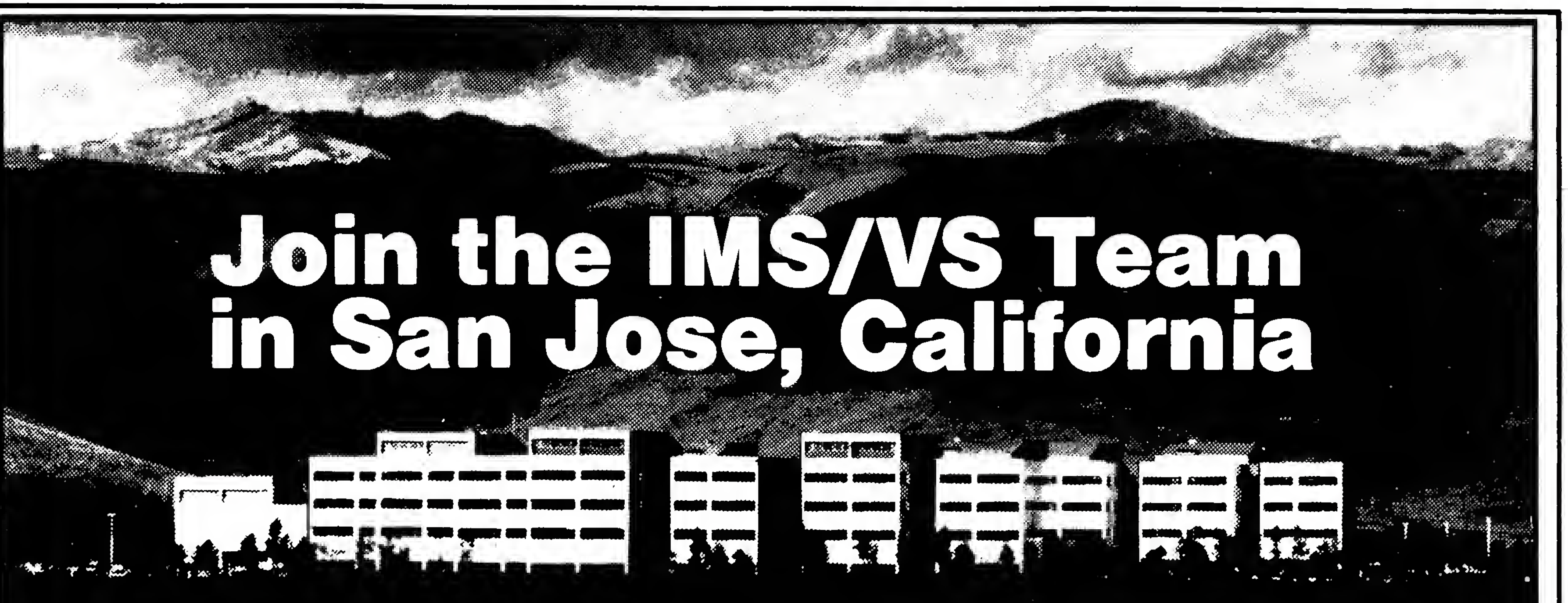

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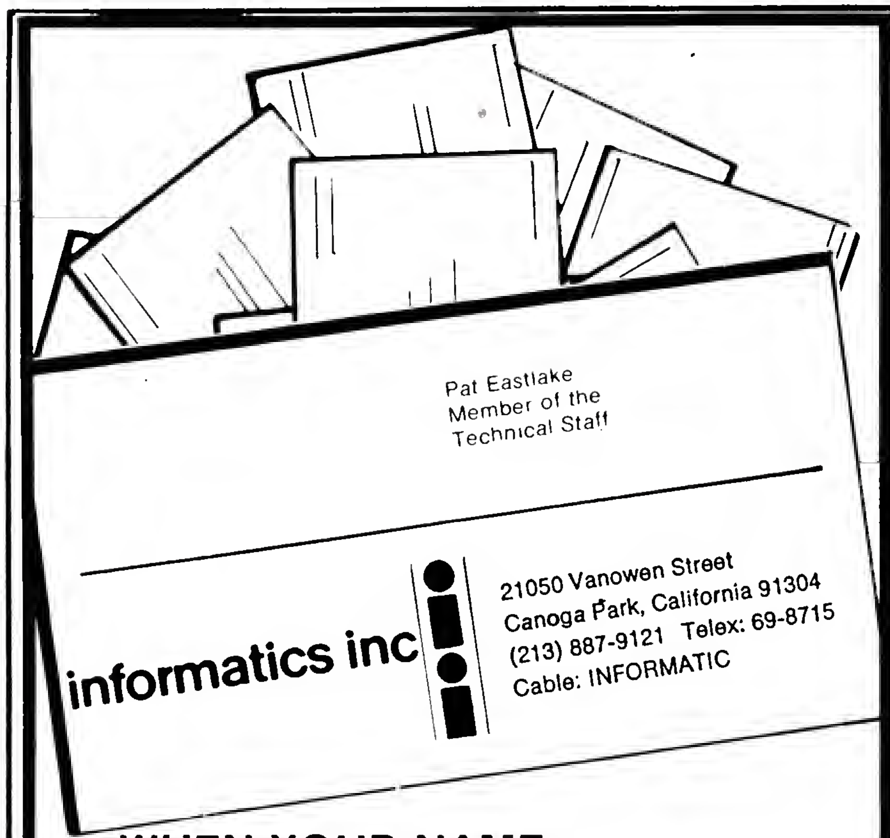

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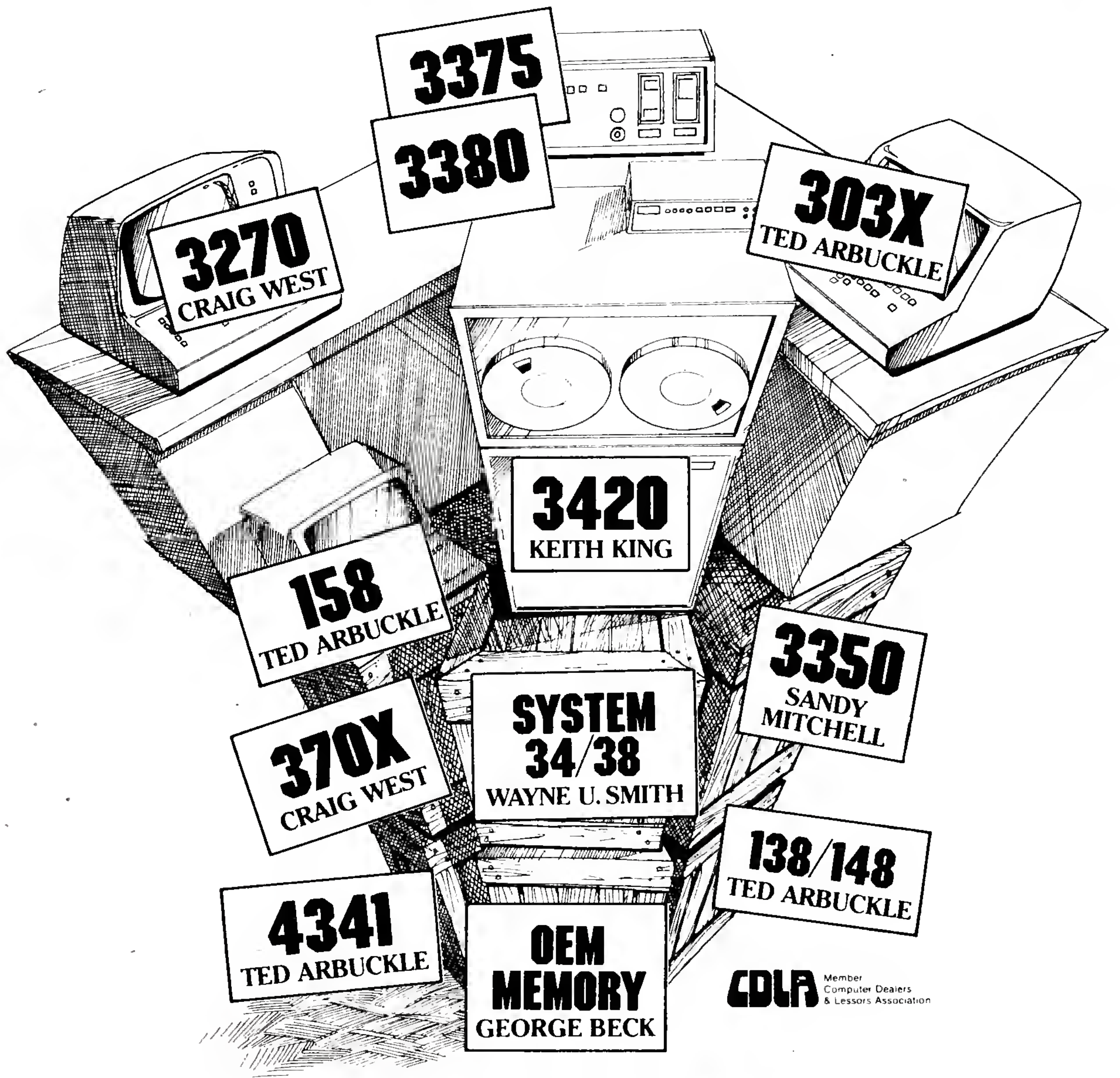

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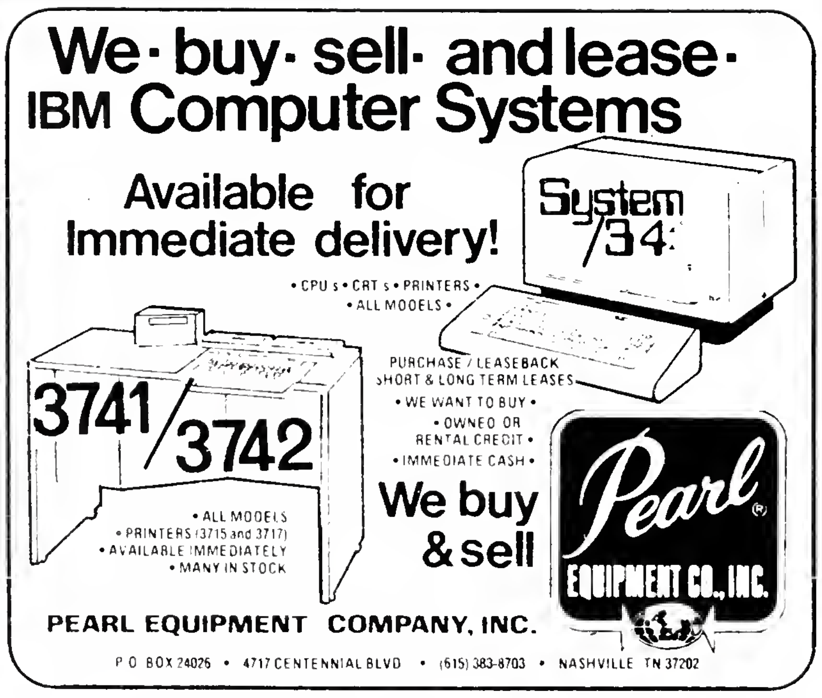

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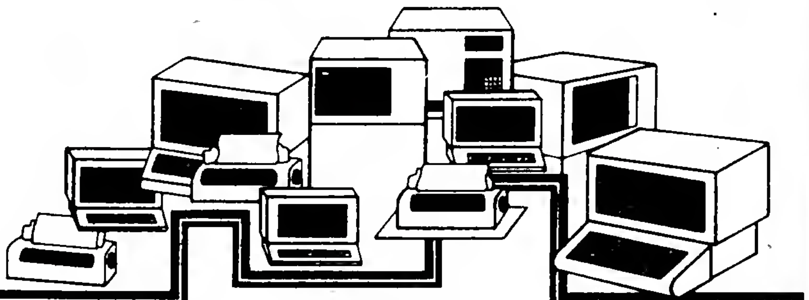

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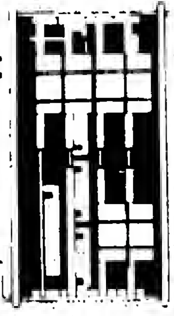

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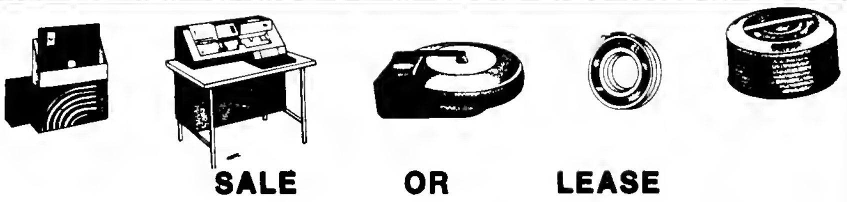

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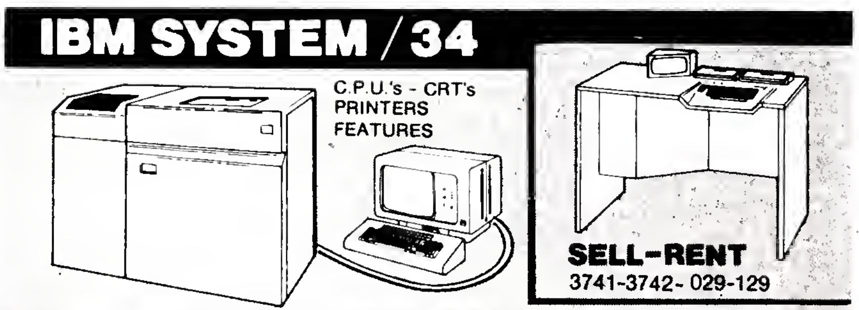

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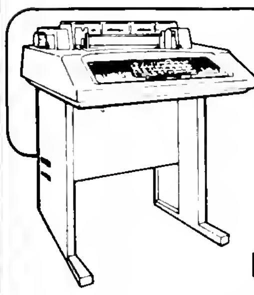

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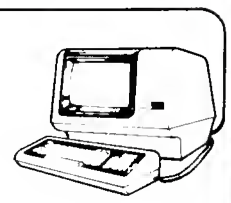

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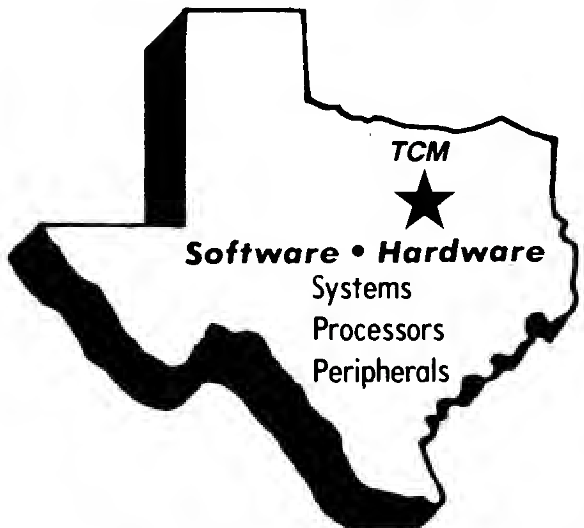

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How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Software") and within headings, if necessary, by type of equipment. The first line of the ad is set in larger, bold type, and should be the standard equipment identification (such as "IBM S370/Mod 40"). (Headlines may be put on more than one line, if desired.) The body copy should describe the equipment very briefly, give the price and the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only $99. (One unit minimum, and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of *Computerworld*. It's a simple and effective system for buying and selling hardware and software.

How to Place an ad in The Bulletin Board.

Ads are accepted in the mail, over the telecopier or by phone. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it, using no more than 12 characters (including spaces) per line for headlines, and no more than 28 characters (about 5 words) per line in the body copy using our standard typefaces. (A standard unit can take up to 14 lines of body copy, but each line of headline consumes the equivalent of two lines of body copy.)

Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classified section under the heading "The Bulletin Board." We assume no liability for errors beyond the price of the ad in the case of material errors.

Here's the Address and Phone.

Bulletin Board
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Computerworld
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The Bulletin Board

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Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications are: **Altos, Burroughs, Comtrol Data, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Salvage, Sperry Univac, Teletype, Terminals, TI, WANG, Miscellaneous.**

Copy: Copy for your ad must be cleanly typewritten and may be sent in via the mail or by telecopier (telecopier extensions are 410 and 451). Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. Nor borders or logos are allowed.

Cost: The price for each standard unit is $99.00 (One unit minimum and no fractional units allowed). There are no agency commissions and no quantity discounts.

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Name:________________

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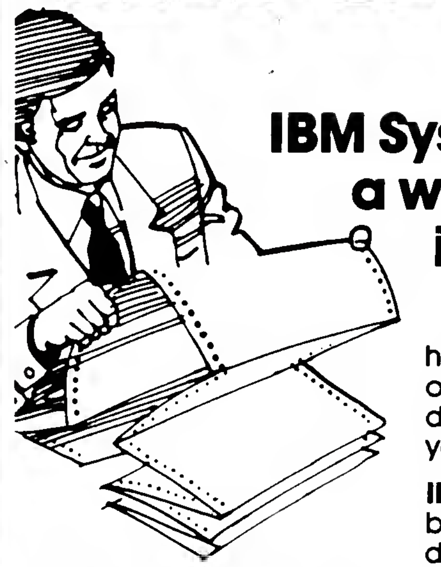

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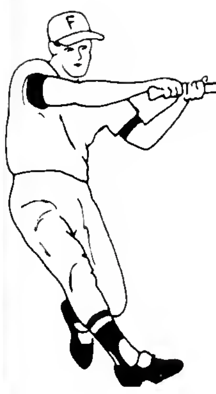

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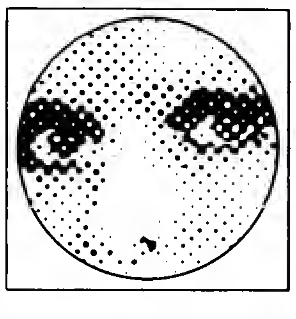

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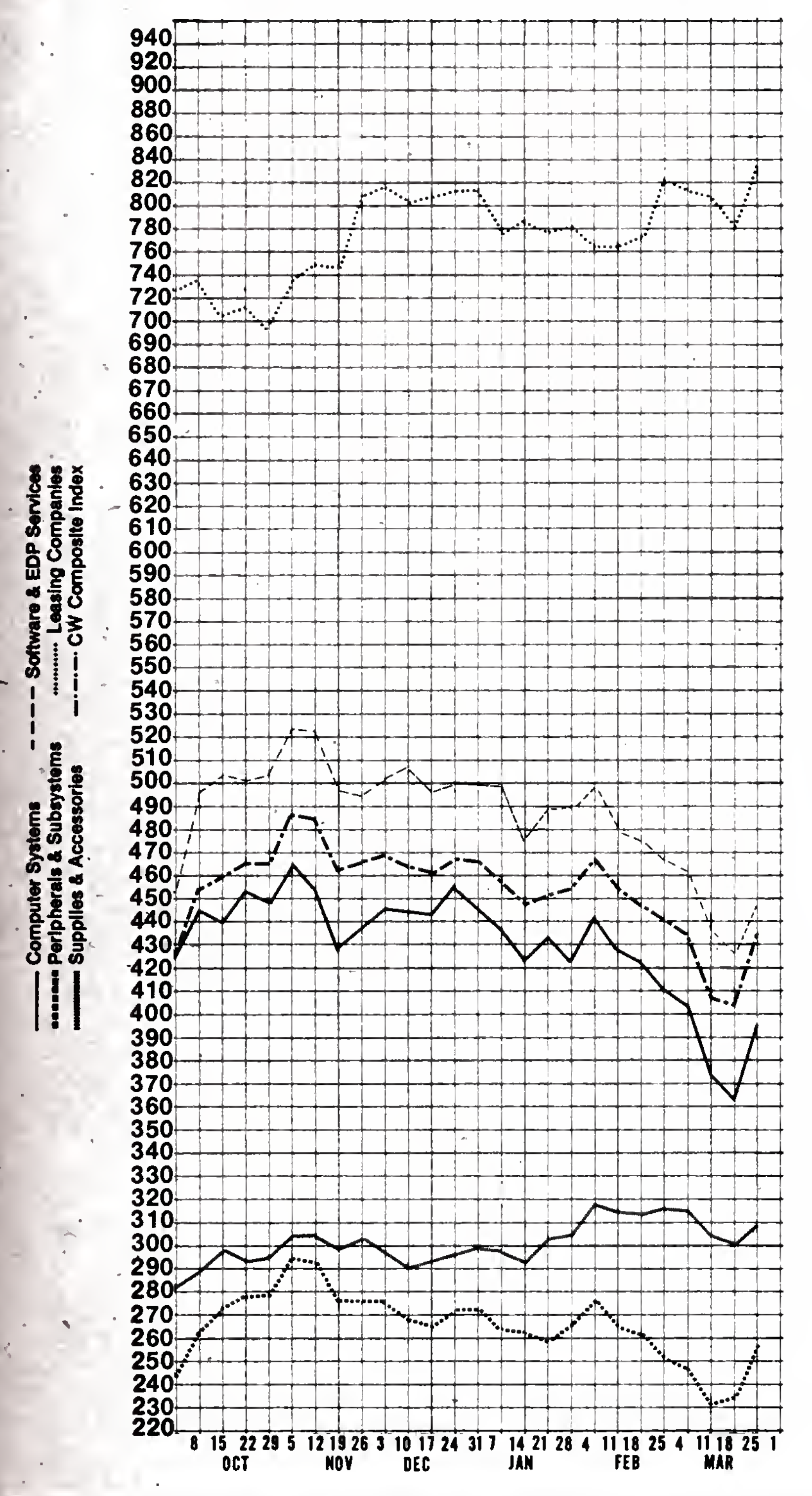

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 24, 1982

All statistics compiled,
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Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1981-82 RANGE (1)	CLOSE MAR 24 1982	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	19- 46	19	+ 1/4	+1.3
N	BURROUGHS CORP	28- 72	34 1/8	+1 1/2	+4.5
O	COMPUTER AUTOMATION	9- 28	9	+ 1/2	+5.8
N	CONTROL DATA CORP	19- 42	32	+2 3/8	+8.0
N	CRAY RESEARCH INC	25- 49	27 3/4	+1	+3.7
N	DATA GENERAL CORP	27- 87	31	- 1/4	-0.7
N	DATAPOINT CORP	20- 68	24 1/4	+2 3/4	+12.7
N	DIGITAL EQUIPMENT	72-113	78 1/4	+3 1/8	+4.1
A	EECO INC	6- 19	6 3/8	+ 1/4	+4.0
N	ELECTRONIC ASSOC.	5- 13	7 3/8	+ 1/4	+3.5
N	FOXBORO	42- 62	50 3/8	+2 7/8	+6.0
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 16	4 1/4	+ 5/8	+17.2
N	HARRIS CORP	28- 60	30 1/8	+ 7/8	+2.9
N	HEWLETT-PACKARD CO	33- 54	41 1/4	+2 7/8	+7.4
N	HONEYWELL INC	63-115	67 1/2	+2 1/4	+3.4
N	IBM	49- 73	59 1/8	+1 3/4	+3.0
O	IPL SYSTEMS INC	6- 13	5 3/4	+ 1/2	+9.5
O	MAGNUSON COMP SYSTS	3- 32	3 7/8	+1	+34.7
N	MANAGEMENT ASSIST	9- 28	12 1/4	+2	+19.5
O	MINI-COMPUTER SYST	0- 4	1 1/4	+ 1/2	+66.6
N	MODULAR COMPUTER SYS	7- 32	7 1/4	+ 1/4	+3.5
N	MOHAWK DATA SCI	10- 32	11 3/8	+1 1/2	+15.1
N	NCR	39- 76	42 3/8	+ 7/8	+2.1
N	PRIME COMPUTER INC	17- 49	19 3/4	+ 7/8	+4.6
N	PERKIN-ELMER	19- 36	21 5/8	+1 3/4	+8.8
N	SPERRY CORP	27- 65	29	+2 1/4	+8.4
O	TANDEM COMPUTERS INC	13- 35	24	+1	+4.3
N	TEXAS INSTRUMENTS	71-151	80	+3 1/8	+4.0
A	WANG LABS.	22- 46	25 3/8	+2 3/8	+10.3

LEASING COMPANIES

EXCH		PRICE 1981-82 RANGE (1)	CLOSE MAR 24 1982	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	18- 29	23 1/4	+ 1/4	+1.0
N	COMDISCO INC	16- 27	23 5/8	+2	+9.2
B	COMMERCE GROUP CORP	1- 2	1/4	- 1/4	-50.0
O	COMPUTER INVSTRS GRP	1- 4	1/2	+ 1/4	+100.0
O	CONTINENTAL INFO SYS	4- 9	5	0	0.0
N	DPF INC	5- 13	9 3/4	+ 3/4	+8.3
O	ITEL	1- 15	1	- 1/8	-11.1
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 30	23 3/4	+1 1/4	+5.5

SOFTWARE & EDP SERVICES

EXCH		PRICE 1981-82 RANGE (1)	CLOSE MAR 24 1982	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	1 1/4	+ 1/4	+25.0
O	ADVANCED SYSTEMS INC	10- 15	12 1/2	+ 1/4	+2.0
O	ANACOMP INC	10- 19	10 3/8	+ 1/4	+2.4
O	ANALYSTS INTL CORP	3- 14	7 1/2	0	0.0
A	APPLIED DATA RES.	13- 25	19 1/2	+2	+11.4
B	ASTRADYNE COMP IND	2- 5	2 7/8	- 1/8	-4.1
N	AUTOMATIC DATA PROC	22- 32	27 3/8	+2 1/8	+8.4
O	CGA COMPUTER ASSOC	4- 25	5 1/4	+ 1/4	+5.0
O	COMPUTER HORIZONS	1- 5	2 1/4	0	0.0
O	COMPUTER NETWORK	4- 9	4 1/4	+ 1/4	+6.2
N	COMPUTER SCIENCES	12- 30	13	+ 1/2	+4.0
D	COMPUTER TASK GROUP	10- 23	10 1/2	+ 3/4	+7.6
O	COMPUTER USAGE	2- 10	3	+ 1/8	+4.3
O	COMSERV CORP	9- 16	14 1/4	+2 1/4	+18.7
O	COMSHARE	7- 21	7 1/2	+ 5/8	+9.0
O	CULLINANE DATABASE	15- 37	27 1/2	+3 1/4	+13.4
O	DATA DIMENSIONS INC	0- 4	3/8	0	0.0
O	DATATAB	1- 4	5/8	- 3/8	-37.5
O	DSI CORP	4- 9	4 1/4	+ 1/2	+13.3
O	DYATRON CORP	3- 11	3	0	0.0
N	ELECTRONIC DATA SYST	15- 30	21 3/4	+1 1/2	+7.4
O	INFORMATICS INC	10- 23	15 1/4	+1	+7.0
O	INSYTE CORP	1- 3	1 3/4	+ 1/8	+7.6
O	IPS COMPUTER MARKET.	1- 4	1 1/8	- 1/8	-10.0
O	KEANE ASSOCIATES	4- 8	4	0	0.0
A	LOGICON	12- 38	13 3/4	+1 5/8	+13.4
O	MNGT SCI AMER INC	17- 26	18 3/4	+1	+5.6
O	MATHEMATICA INC	12- 26	23	+2	+9.5
O	MATHEMATICAL APP GRP	14- 28	15 1/2	+1 1/2	+10.7
O	NATIONAL DATA CORP	14- 28	15 7/8	+1 3/8	+9.4
N	PLANNING RESEARCH	5- 13	7 1/8	+ 5/8	+9.6
O	PROGRAMMING & SYS	1- 2	1 1/4	0	0.0
O	REYNOLDS & REYNOLD	16- 26	19 3/4	+ 1/4	+1.2
O	SEI CORP	17- 28	23	+ 1/2	+2.2
O	SHARED MEDICAL SYST	26- 37	28 1/2	+2 3/8	+9.0
O	STSC INC	6- 8	6 1/4	+ 1/4	+4.1
O	SCIENTIFIC COMPUTERS	6- 16	7 1/2	+1 1/8	+17.6
O	SOFTWARE AG	7- 23	7 1/2	+ 1/4	+3.4
N	TYMSHARE INC	16- 58	17 3/4	- 1/2	-2.7
A	URS CORP	11- 18	11	0	0.0
N	WYLY CORP	7- 20	7 7/8	+ 1/2	+6.7

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1981-82 RANGE (1)	CLOSE MAR 24 1982	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	2- 25	1 3/4	- 1/8	-6.6
A	ANDERSON JACOBSON	9- 26	11 3/8	+2 1/8	+22.9
O	AUTO-TROL TECHNOLOGY	8- 62	10	+ 1/2	+5.2
O	BANCTEC INC	14- 35	15	+1	+7.1
O	BEEHIVE INT'L	6- 18	7 1/2	+1 1/8	+17.6
A	BOLT,BERANEK & NEW	9- 25	15 3/4	+2 1/8	+15.5
O	CAMBEX CORP	2- 9	2 5/8	+ 5/8	+31.2
N	CENTRONICS DATA COMP	7- 40	10 1/2	+1 1/2	+16.6
A	CETEC CORP	4- 9	4	0	0.0
O	COMPUTER DEVICES INC	4- 10	6 1/8	+ 1/2	+8.8
O	COGNITRONICS	2- 11	2 7/8	+ 1/2	+21.0
O	COMPUTER COMMUN.	1- 2	1	+ 1/8	+14.2
A	COMPUTER CONSOLES	16- 28	20 1/2	+2 3/4	+15.4
O	COMPUTER TRANSCEIVER	3- 9	5 1/4	0	0.0
N	COMPUTERVISION CORP	20- 49	26 7/8	+1 1/2	+5.9
N	CONRAC CORP	17- 28	23	+ 3/4	+3.3
A	DATA ACCESS SYSTEMS	2- 23	2 7/8	+1 1/8	+64.2
A	DATAPRODUCTS CORP	17- 44	20 1/4	+2	+10.9
O	DATUM INC	2- 5	1 1/2	0	0.0
O	DAVID JAMISON CARLYL	3- 7	5 7/8	+1 1/8	+23.6
O	DECISION DATA COMPUT	3- 6	3 1/4	+ 1/4	+8.3
O	DELTA DATA SYSTEMS	2- 4	1 3/4	- 1/8	-6.6
O	DATARAM CORP	4- 15	5 5/8	- 1/4	-4.2
N	ELECTRONIC M & M	3- 9	3 1/8	- 1/8	-3.8
O	EVANS & SUTHERLAND	10- 40	23 1/4	+2 1/4	+10.7
O	GENERAL COMPUTER SYS	1- 12	4 1/2	0	0.0
N	GEN'L DATA COMM IND	7- 18	9	+1 7/8	+26.3
O	GENERAL TERMINAL CP	1- 4	5/8	+ 1/8	+25.0
N	HAZELTINE CORP	19- 35	29 1/2	+1 5/8	+5.8
O	INFORMATION INTL INC	8- 17	11	+ 3/4	+7.3
O	INTEL CORP	21- 51	27 1/2	+2 1/4	+8.9
O	IPL SYSTEMS INC	5- 15	5 3/4	+ 1/2	+9.5
A	LUNDY ELECTRONICS	7- 18	7 1/2	+ 1/4	+3.4
A	MSI DATA CORP	11- 27	16 3/8	- 1/4	-1.5
O	NETWORK SYSTEMS CORP	14- 25	16 5/8	+1 3/4	+11.7
O	OMEX	5- 8	5	0	0.0
N	PARADYNE CORP	25- 52	33 1/8	+1 7/8	+6.0
A	PENRIL CORP	7- 17	7 7/8	- 3/8	-4.5
O	RAMTEK CORP	9- 23	13 7/8	+1 3/4	+14.4
N	RECOGNITION EQUIP	4- 21	4 5/8	+ 1/8	+2.7
O	SCAN DATA	1- 5	3/4	0	0.0
N	STORAGE TECHNOLOGY	18- 40	25 7/8	+ 1/6	+0.4
O	SYKES DATATRONICS	8- 24	22 1/4	+1 1/2	+7.2
A	T BAR INC	12- 19	14 1/4	+ 1/4	+1.7
A	TEC INC	4- 9	9 3/8	+1 1/2	+19.0
N	TEKTRONIX INC	42- 70	48 5/8	+4 1/8	+9.2
N	TELEX	5- 9	7 7/8	+ 5/8	+8.6
O	TESDATA SYSTEMS CP	5- 17	5 7/8	+ 7/8	+17.5
A	TIMEPLEX INC	7- 19	8 5/8	+1 5/8	+23.2
O	WILTEK INC	1- 3	1 5/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1981-82 RANGE (1)	CLOSE MAR 24 1982	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 17	12 3/8	+ 5/8	+5.3
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	15- 24	16 1/2	+ 3/8	+2.3
O	CYBERMATICS INC	1- 2	1	0	0.0
A	DUPLEX PRODUCTS INC	12- 17	13 1/2	+ 1/2	+3.8
N	ENNIS BUS. FORMS	15- 23	17 3/8	+ 3/4	+4.5
N	3M COMPANY	48- 65	54	+4 1/8	+8.2
O	MOORE CORP LTD	27- 38	31 1/8	+ 1/8	+0.4
N	NASHUA CORP	16- 33	16 3/8	- 1/8	-0.7
O	STANDARD REGISTER	30- 41	37	+ 1/4	+0.6
A	TAB PRODUCTS CO	14- 30	14 3/4	+ 3/4	+5.3
N	WALLACE BUS FORMS	22- 36	29	+1 3/8	+4.9

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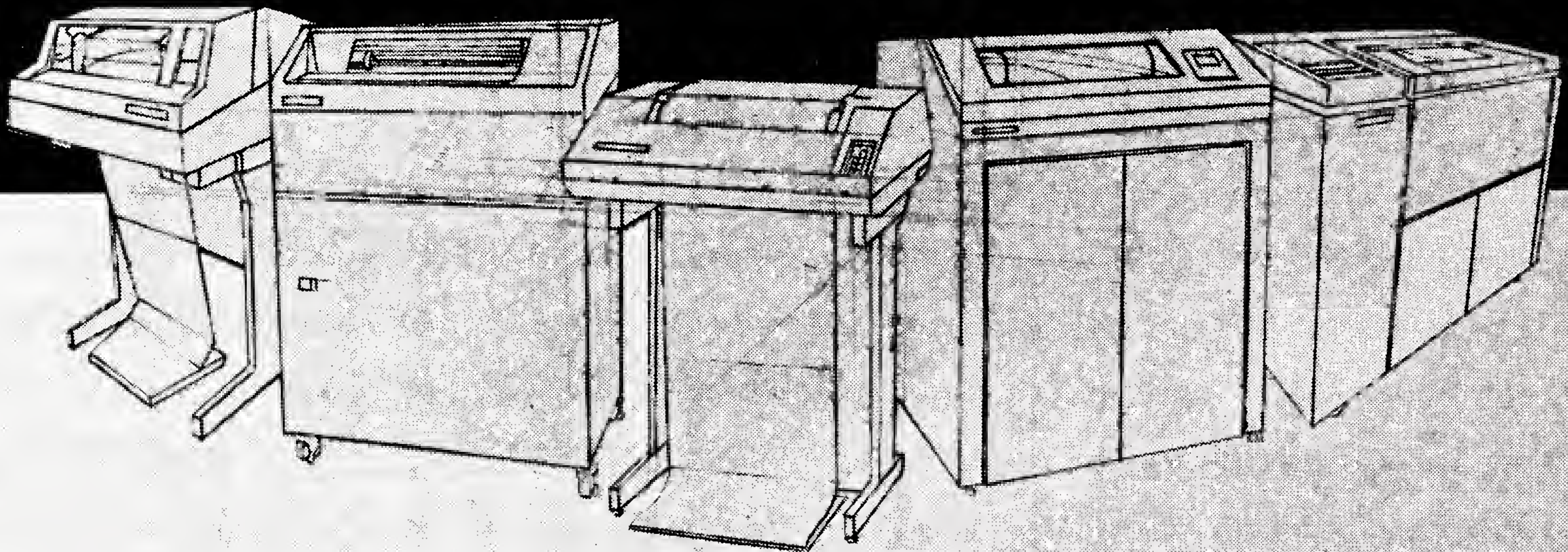

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